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REMARKS ON COD LIVER OIL.

By William Procter, Jr.

The extensive use now made of cod liver oil as a curative agent, both by the medical profession and by the people, renders information bearing on the subject sufficiently interesting to attract attention. Heretofore but little has appeared in the journals, throwing light on the cod liver oil manufacture and trade of our north-eastern coast, and it is almost a matter of surprise that so little knowledge of the subject should be in the possession of the numerous persons whose business it is to dispense daily this, at present, popular medicine.

The essay of De Jongh in 1843, has made us acquainted with the fish liver oils used in Germany under the name of cod liver oil, and also with their complex chemical constitution, by several most difficult analyses. The general facts relating to the subject as ascertained by De Jongh will be found in a paper by Dr. Pereira, reprinted in vol. xxi, page 136 of this Journal.

The three varieties of cod liver oil known in the commerce of this country are parallel with those described by De Jongh, viz: pale yellow, pale brown, and dark brown. The collectors of the oil, in the Baltic and German seas, do not appear to confine themselves to the Gadus morrhua or true codfish, but the Gadus carbonarius, (coal fish) Gadus callarius, (or dorse) and Gadus pollachius, (or pollack) all contribute to the product as furnished by the fishermen of the Norwegian coast.

The same is true of the cod liver oil production of the New England Coast :—the *hake*, the *haddock*, and the *pollack*, (Gadus pollachius) all contribute more or less to the commercial oil, especially to the light colored variety, and are sometimes wholly substituted for it. This is partially the result of the habits of the fish. The codfish, associated in shoals more or less numerous, move about from one feeding ground to another along the coast, as humor or the abundance of their food may incite them. They are sometimes preceded by, and sometimes followed by shoals of the hake, haddock, or pollack, these fish seeking similar food, (marine worms) and frequenting the same submarine formations. The fishermen may therefore commence their labors in the morning among the true cod, and before evening sets in find themselves pulling in some one, or all the varieties mentioned, as the case may be. Now these fish appear to be all sold under the general title of codfish, but dealers in the article know the difference, and commercially the true codfish commands a better price. Less care is extended to the livers, which, unless especially cared for, are thrown indiscriminately into the receptacles as they are taken from the fish.

De Jongh, whilst admitting the mixed character of the cod liver oil used in Germany, offers no opinion as to the relative therapeutical merits of the pure liver oils of the dorse, coal fish, and pollack ; nor has he shown that these oils differ in chemical constitution from the true cod oil, his three analyses relating only to the commercial varieties founded on color.

To the kindness of Mr. O. S. Hubbell of this city, who has visited the district where the oil is made, and himself engaged in its preparation, I am indebted for much of the information contained in this paper, and for specimens of the pure liver oils of each of the four varieties of fish mentioned; the results of some few experiments with them will be given in another part of this paper.

Not forgetting that these oils contribute more or less to much of the commercial cod liver oil, although not acknowledged, we will examine a little closer into the origin and commercial history of the latter.

The terms *bank* oil, *straits* oil, and *shore* oil, are familiar to the large dealers in cod liver oil.

The *bank* oil, so called from its manufacture from fish caught on

the great fishing ground of the Banks of Newfoundland, is the best when in good condition, because in that locality the fish attain a size and perfection not equalled in any other waters.

Our readers are generally aware that these Banks, as they are called, consist of thousands of square miles of shoal water with sandy bottom off the north-eastern coast of North America, and so named from their contiguity to the Island of Newfoundland. They constitute the largest sub-marine elevation in the world, and abound in species of worms which are the great attraction to the codfish. (Murray's Encyc. Geograph.) The great north-eastern current of the Atlantic, after sweeping around the coral-bound coasts of Florida, and gliding past the insular impediments of the Bahamas, laden with spoils of the living and the dead from the tropical seas, proceeds on uninterruptedly until it strikes on this great sub-marine plain (which perhaps it has contributed to elevate,) and there, deprived partly of the momentum which has upheld its suspended contents they are deposited, to be an inexhaustible and ever replenishing store for the benefit of the innumerable finny hordes that animate the waters above. No wonder, therefore that the codfish frequent them in such countless numbers, that it is necessary to assist the imagination by recollecting that ten millions of eggs have been counted in a single female codfish of moderate size, to appreciate their abundance. In this favored locality they frequently attain a size of forty to seventy pounds, and their livers are not only larger and healthier, but afford a greater per centage of oil weight for weight. The best Bank livers frequently contain one-half and sometimes two-thirds of their weight of oil.

The British fishermen who have all their arrangements for oil making on the shores of Newfoundland have the greatest advantages, for they not only have the best fish, in common with the fishermen of other nations who frequent the banks, but they have the *exclusive right to fish within three miles of the coast.* Their boats run out from platforms erected along the shore, at the fishing settlements, and as soon as they catch a load, return and deliver them to persons on the platforms, who attend at once to cleansing and salting the fish, and to the preparation of that portion of the oil obtained from fresh livers, the greater part, however, being left for conversion into brown oil, as will be noticed presently. It may

be true also that the finest fish approach the shore where the marine annelidæ are more likely to abound than in the deeper sea beyond the imaginary line drawn along these coasts by the treaties of English statesmen.

The American fishermen not having the same facilities, possessing by treaty only the right to dry their fish on the unoccupied portions of the coast, and having necessarily much larger vessels engaged in the service, visit the drying stations at longer intervals, and from its comparatively small importance care little about the production of the white or pale yellow oil. In these fishing vessels, casks are suitably placed on deck, and as the fish are cleaned at sea, the offal is thrown overboard, whilst the livers are cast into the receptacles, where they accumulate for days and weeks, the tissues undergoing a gradual disintegration as the putrefactive process progresses, permitting the oil to escape, which, from its inferior density, gradually rises to the surface. The first oil that separates on the surface, before the process of putrefaction has fairly set in, is almost as sweet and pure as the shore oil, and constitutes the medium quality or *straits* oil, corresponding with the pale brown oil of De Jongh. It commands a much better price than the brown oil. Its color is due partially to the oxidation of the gaduin by exposure to the air, and partly to contact with the bile constituents and decomposing tissues.

The *brown* oil is made from the residues after the *straits* oil has been skimmed off from the casks, or it may include the latter if the fishermen postpone its removal until it has too far deteriorated by exposure. The brown oil is made just when it suits the convenience of the fishermen, and as they cannot do it aboard their vessels, the periods are longer or shorter according to their luck in fishing. The contents of the liver casks are removed to boilers, heated with some water, and thrown on strainers, that the oil and watery part may drain through. The oil is separated, heated to free it from water, and put into barrels for commerce.

Shore oil, correctly speaking, is the kind made on the coast from fresh livers, before they have had time to change, and applies as much to the bank oil so made, as to that produced along

the New England shore of the Atlantic, to which latter product, however, the name is usually applied.

Before describing the several methods adopted in the extraction of the shore oil, it will be well to explain the condition in which the oil exists in the livers. Healthy cod livers are plump, have a uniform, pale fawn color, and are exceedingly tender. When unhealthy, they are less plump, smaller and more or less discolored. The latter are generally derived from fish that frequent unfavorable localities, or where their natural enemies interfere with their quiet feeding. The oil exists in the tissues of the livers as an albuminous emulsion consisting of an aqueous fluid intimately intermixed with the oil. When this is pressed out and allowed to stand, the oil gradually separates and rises to the surface, whilst an opalescent fluid collects beneath. The recent oil, when not injured in the process of preparation, has a fresh-fishy odor, which it gradually loses, and afterwards, by age and exposure, acquires the odor and taste of lamp oil.

The ordinary process of making shore oil is to throw eight or ten buckets full of cod livers into a suitable boiler, add three or four gallons of water and heat them till the tissues are broken up and the whole becomes a kind of magma. A large cask or tub is then arranged with a straining cloth across its open head, and the contents of the boiler poured upon it. The oily and watery portions pass through, leaving the membranous parts on the strainer. By standing, the oil separates, is drawn off, and after another straining is barrelled for the market.

The oil of cod livers is made in this way, in quantities varying from a few gallons, in the fisherman's cottage, to hundreds of barrels in the various fishing establishments, which in one form or another, are located along the coast from Cape Cod to Nova Scotia, but most largely perhaps, in the neighborhood of Gloucester, Massachusetts. The New England oil has less color than the bank (shore) oil, but it is less rich in the peculiar principles of the oil, a fact attributable perhaps to the less perfect development of the fish of our own fishing grounds; a supposition corroborated by the fact that the yield of oil by the livers varies from 10 to 30 or 40 per cent. on the latter stations, whilst on the Banks from 30 to 60 per cent. is the more usual product.

Since the extensive employment of cod liver oil in medicine,

more care has been extended in preparing it for medicinal use, and perhaps the most improved innovation on the old method described, is to expose the livers contained in a suitable tin reservoir, heated with steam applied externally by a jacket, until they assume the condition of a magma, when this is thrown on a strainer, and the mixed oil and water that passes separated and purified, as has been before described, with the precaution to act on the livers as soon after their removal from the fish as possible, and to perform the process with such expedition that the oil is not injured by undue exposure to the air.

The fishermen along shore sell their oil to the store keepers in trade, who in turn, as it accumulates, send it to the large dealers in the seaport towns. At some of these establishments in Boston there are reservoirs, capable of holding many hundreds of gallons, constructed of stone and cement, in their cellars, in which the brown oil is kept separately. As this oil is brought in from the smaller dealers or fishermen, it is emptied into these, where it clarifies by subsidence and is pumped up into barrels for commerce. The exposure which it undergoes tends to increase its strong lamp-oil odor, and as a large proportion of the brown oil employed in the United States passes through the hands of these dealers, it follows that the medical public do not receive even this oil in its least repulsive form. The white oil, on the contrary, is kept in the barrels into which it is originally introduced, and these, if originally tight and pure, form very good receptacles. Some of the druggists of Boston, New York and Philadelphia, have made special arrangements with persons engaged in the codfishery, and who make the oil by the improved method, with a view to its use in medicine; and where these persons prove true to their engagements, there is no reason why the blandest and purest oil should not be obtained.

A specimen of pure cod liver oil in my possession, is entirely free from the lamp-oil odor, but has the fresh-fishy smell indicative of its recent and careful preparation. Its sp. grav. is .917. at 72° Fahr. Mixed with ordinary sulphuric acid, it is instantly changed to a dark red brown transparent color, like tincture of kino. Mixed with nitric acid, sp. grav. 1.36 and shaken, it is colored instantly of a pinkish cast, which soon becomes brown,

and by standing on the acid it gets darker, and finally is slowly decomposed, frothing over with evolution of nitrous gas.

Nitric acid of sp. grav. 1.215, (formed by mixing 3 parts of ordinary white nitric acid with 2 parts of water), when shaken with it, at first produces no change, but gradually the oil assumes a dull green hue, retaining its transparency. After standing four days on the acid, the green color slowly changes to brown. Mixed with an acid solution of nitrate of mercury (as used for citrine ointment), the oil thickens, becomes yellow, and finally orange-yellow, with evolution of nitrous gas and much frothing.

The specimen of *haddock* liver oil has less color than the cod oil, has a slight lamp oil odor and taste, and its specific gravity is .9195. It reacts with sulphuric acid, acid nitrate of mercury, and nitric acid sp. gr. 1.36, almost precisely like the cod oil. Nitric acid sp. gr. 1.215 after contact for four days colors it a clear brown without a shade of green.

The specimen of *hake* liver oil resembles the haddock oil in color, odor and taste, Its specific gravity is .915. It reacts with sulphuric acid, nitric sp. gr. 1.36, and the acid nitrate of mercury in the same way, but with nitric acid sp. grav. 1.215; by standing 24 hours it gradually assumes a greenish brown color, which it loses as the action of the acid continues, and becomes of a light brown hue, much lighter than that of the haddock oil.

The specimen of *pollack* liver oil very closely resembles the hake oil in color, odor, and taste, and in all the reactions with sulphuric and nitric acid. Its specific gravity is .9155.

Sperm (lamp) oil, when treated with nitric acid sp. gravity 1.36, is colored pinkish brown gradually, but when agitated with the acid sp. grav. 1.215, it assumes only a pale brown color without a shade of green, hence the presence of this oil or of haddock oil should render the green color occasioned by this acid on true cod oil to be less deep.

These reactions are not offered as affording reliable means of distinguishing true cod-liver oil, either from the liver oil of allied species of fish, or from whale oil. To arrive at any such desirable criteria we must be better acquainted with the organic constituents of all the oils, and their relations to reagents. Yet they may serve to show how little dependence can be placed in the action of the so called tests for cod-liver oil, sulphuric and nitric acid.

Modes of administering cod liver oil. The general disgust excited by the taste and odor which the commercial cod-liver oil often presents, has arisen from the fact that the largest part of that now used has either been carelessly made or badly preserved, or because many physicians still cling to the idea that the rancid brown oil possesses more medical power than the light yellow or proper medicinal oil. Under the impression that the *lamp oil odor* is a true characteristic of all cod-liver oil, though less apparent in the light-colored kind, some physicians in prescribing it for children or adults, whose fastidiousness rejects it unless disguised more or less effectually, have had the oil incorporated with mucilage in the form of an emulsion. One objection to this medicine is, that cod-liver oil, to produce its full effects, should not only be long continued in use, but should be given in increased doses, so that in the form of an emulsion, except for children, the quantities would be excessively bulky. By far the best way to take it, whether *pure* or *rancid*, is the following: When porter (or beer) is not contra-indicated, put two or three table-spoonfuls of it in a a small tumbler, pour on to this the oil, to be taken without stirring or otherwise mixing them, and then agitate the bottle of porter, and cover the oil with the foamy beverage. By this means the patient does not see the oil, the first impression in the throat is from the porter, and the oil passes down untasted, whilst the substratum of the beverage effectually removes any lingering taste of the medicine. It is well to take a sip of the porter before taking the dose.

The syrup of sarsaparilla answers equally well, and is devoid of the stimulant quality of the porter. When the oil is in its purest state, but little difficulty is presented in swallowing it, and it may be taken floating on peppermint or other aromatic water, observing to swallow a mouthful of the unmixed water before hand.

A far more serious objection, according to Mr. Hubbell, to taking rancid cod-liver oil in the form of an emulsine, is that when so taken it remains longer in the stomach, becomes mixed with its contents, and gives rise to eructations more disagreeable to the patient than the act of swallowing the medicine. On the other hand, when taken merely floating on a vehicle in the manner mentioned, the oil soon passes into the duodenum, and its exhibition is attended with less of the disagreeable accompaniment mention-

ed, especially if the oil is taken two or three hours after meals, instead of just before or after them.

Still another objection to the emulsive preparations of this medicine is the following. Cod-liver oil has a strong tendency to absorb oxygen, to become rancid, and to acquire the odor and taste of lamp-oil. By admixture with water in an emulsion, this tendency is greatly increased, so much so, that by the time a bottle is consumed the last portions are sometimes exceedingly disagreeable.

When the oil is in its purest and freshest condition, comparatively little objection is made to it by the large majority of patients, and it should be the aim of Pharmaceutists not only to encourage the production of carefully made oil, but they should give much more attention to its *preservation*, than has heretofore been extended.

Preservation of Medicinal Cod Liver Oil.—As soon as manufactured, the oil is introduced into barrels, which are securely bunged and nearly full. If these barrels are tight, and pure at first, there is no difficulty in keeping the oil in good condition for a year at least, as Mr. Hubbell has ascertained by trial. But what are the facts:—A druggist buys a barrel of the oil in many instances, and commences its sale by the removal of a few gallons, thus admitting the air to a larger surface with each removal of the oil, which is thereby becoming more and more deteriorated, especially if slow demand lengthens the period required in the disposition of the barrel. The same remark applies to the retail druggist and apothecary. He buys say a gallon or two of the oil, keeps it in the same vessel, until he has retailed it out in small quantities.

Now the true course to pursue, is for the druggist when he opens a barrel to fill it into tin cannisters to suit the wants of his customers, the apothecaries, and seal these securely. The apothecary should at once on buying a cannister, bottle the oil in quantities to suit the demands of his neighborhood, and he had better assume the extra trouble of opening a bottle, when purchasers bring vessels of their own for the oil, than not pursue this course.

With these precautions in the wholesale and retail dealer, cod liver oil may be preserved in its best condition for a long time, and if it really merits the high encomiums which have been passed

on it, the additional trouble which these precautions require, should not be withheld. There are persons who, in using the cod liver oil, feel disapyointed that a single bottle or two has not wrought the changes they so earnestly desire, and give up its use. Such persons should be advised not to waste their money; for unless (even in cases where the alterative and nutritive effects of the oil are strongly indicated,) its use is persevered in for a considerable length of time, and in doses by no means homœopathic, it will be in vain to expect the excellent results which have been derived from its curative power in the hospitals as well as in private practice: results greatly more attainable if the patient is not subjected to the constantly recurring disgust and nausea, from ill made and badly kept oil.

ON THE MEANS FOR DETERMINING THE PURITY OF CERTAIN CHEMICALS AND DRUGS, AND FOR DETECTING ADULTERATIONS.

(Continued from page 3.)

[A large part of the article on Iodine has been taken from observations by Dr. Herzog, of Germany, published in the Pharmaceutical Journal, Dec. 1850, and Central Blatt.—EDITOR.]

IODINE as met with in commerce, is presented in two forms, viz: in well defined dry crystals, having a metallic lustre and blueish black color, as "resublimed" iodine; and as a dark iron grey substance having the appearance of unoxidized iron filings, more or less moist, cohering together in lumps and adhering to the sides of the bottle, called "commercial iodine," or simply iodine.*

The impurities which have been found in iodine, either accidental or designed, are quite numerous, but the British product, which is that most largely used in this country, does not appear to be so frequently the subject of adulteration as that in Continental commerce. The substances which have been noticed in iodine by different writers and chemists are, *water, chloride of magnesium, chlo-*

*See a paper by Alfred B. Taylor, late Drug Inspector for this port, vol. xxii. pp. 193.

ride of calcium plumbago, coal, charcoal in fine powder, bruised slate, black oxide of manganese, sulphuret of antimony, sulphuret of lead (galena), iron scales, iodide of sulphur, sand and *clay.*

Water has been detected in proportions varying from 5 to 15 and even 20 per cent. in the commercial iodine. When the quantity is unusually large the presence of some deliquescent salt as chloride of calcium or magnesium, may be suspected. To detect its presence and proportion, first ascertain the absence of fixed impurities in the specimen, by heating a portion of it in a capsule. This being known, then weigh 100 grains of the iodine and triturate it intimately with 200 grains of fused (anhydrous) chloride of calcium, in a dry atmosphere, quickly put the mixture in a tarred capsule, and heat it to about the temperature of 250o or 300° until all the volatile matter has been driven off. Then weigh the capsule and contents, yet warm, deduct the tare, and any increase in the weight of the chloride may be attributed to water, which is retained by the salt at the temperature above stated.

The Edinburgh Pharm. considers two per cent. of water admissible, and states that 39 grs. of iodine mixed with 9 grs. of quick lime and 3 ounces of water, when heated short of ebullition, slowly form a perfect solution, which, if the iodine does not contain more than 2 per cent. of water, is colored yellowish or brownish yellow from excess of iodine, but if more than 2 per cent., the solution is colorless. This test merely proves that water is present beyond 2 per cent., and not the real per centage—and further, an impure or silicious lime would indicate the absence of water by being insufficient to combine with the intended amount of iodine.

Chloride of Iodine.—Dr. Herzog "considers it remarkable that this adulteration has not hitherto been noticed, since in the preparation of iodine on the large scale, metallic chlorides, which might give rise to the formation of chloride of iodine, are not always excluded." This substance gives to iodine a strong disagreeably pungent smell, very similar to that of cyanide of iodine. When present, it quickly communicates to water, with which the iodine has been mixed, a brownish yellow color, and shows by its reaction the presence of hydrochloric acid. The quantity of chlorine is easily detected by converting 100 grs. into iodide and chloride, with water and iron filings, precipitating the iron with

carbonate of potassa, neutralizing the filtered solution with acetic acid and precipitating the chlorine as chloride of silver.

Cyanide of Iodine.—Dr. Herzog thinks that "the presence of cyanogen is due to the small marine animals, which are always unintentionally, or to the larger ones, which are intentionally mixed up with the sea plants from which kelp is prepared, and which upon being heated, form combinations of cyanogen with the carbonate of soda of the ashes." The presence of cyanogen is determined by dissolving the suspected iodine in a solution of pure potassa, evaporating to dryness, heating to redness to decompose the iodate and cyanate of potassa, dissolving again in water, adding a mixture of sesqui and proto-chloride of iron till it ceases to precipitate. This precipitate is then treated with muriatic acid, and if any cyanogen was present, it will remain undissolved, as prussian blue (ferrocyanide of iron.) The directions of the new Dublin Pharm., (see p. 12 of this volume,) to subject iodine to a preliminary sublimation, has reference to the presence of cyanide of iodine, which constitutes the white acicular crystals referred to.

The Chlorides of Calcium and Magnesium are easily detected by the loss of weight which the iodine sustains when agitated with water, and by evaporating the aqueous washings to dryness, the amount of the impurity may be arrived at. If both chlorides are present, they can be separated by adding an excess of solution of bicarbonate of potassa, which precipitates the lime as carbonate, when the magnesia may be precipitated from the filtered solution by adding the carbonate of potassa in excess. Both of these adulterations are soluble in alcohol, and cannot be detected by the solubility of the suspected iodine in that fluid.

Plumbago is detected by its insolubility in alcohol, and by its sensitiveness to the attraction of the magnet, which will separate it from oxide of manganese, coal, charcoal, sulphuret of antimony, galena, sand and clay.

Black Oxide of Manganese.—If the black insoluble residue of the suspected iodine evolves chlorine when treated with muriatic acid, this oxide is present.

Sulphurets of Antimony and Lead may be detected in the residue, if present by the action of muriatic acid, which disengages sulphuretted hydrogen. The muriatic solution will cause a white

precipitate when added to water, if sulphuret of antimony is present. MM. Henry and Garrot assert that sulphuret of antimony mixed with iodine forms a *red* triple compound too unlike iodine to answer for an adulteration. It may be only the moist iodine that reacts in this way.

Clay, Sand and Slate, if present, may easily be detected by their insolubility in water and alcohol, and their insensibility to heat.

Corrosive Sublimate.—Its great density, 5.42, satiny lustre, and crystalline structure, together with its solubility in ether, are marks by which its purity can readily be established. Both calomel and muriate of ammonia are left by the ether, as well as fused chloride sodium and potassium.

Calomel, Proto-Chloride of Mercury.—Calomel is a white powder of sp. gr. 7.14 to 7.20 insoluble in water, alcohol, ether and dilute muriatic and acetic acid. It is entirely sublimed by heat, is converted into protoxide of mercury by an excess of heat, which is then wholly soluble in acetic acid. Calomel has been adulterated with *carbonate*, *sulphate*, and *phosphate* of lime, *sulphate of baryta*, *carbonate of lead* and even *starch* and *gum;* it also sometimes contains corrosive sublimate as an impurity from carelessness. It is very easy for the physician and apothecary to assure themselves of the purity of calomel. *First* heat it to dull redness on a plate of iron; if it all vaporizes, the above insoluble adulterations are absent. The calomel should then be washed with warm water, and if the filtered washings produce no precipitate with ammonia or iodide of potassium, it is free frome corrosive sublimate, and may be considered medicinally pure.

If a white residue is left after the calomel is sublimed by exposure to heat, it should be treated with diluted muriatic acid; if it dissolves wholly or partially with effervescence, either carbonate of lead or lime is probably present. If the solution is precipitated black by hydrosulphuret of ammonia, and yellow, by iodide of potassium, the base is oxide of lead; if not changed by these reagents and is precipitated white by oxalate of ammonia, the base is lime.

If the residue is more or less blackened, some organic matter

has been present, probably starch or gum. To decide, treat another portion of the suspected calomel, with hot water, and test with solution of iodine and sub-acetate of lead—the former will produce a blue coloration, with starch; whilst the latter will cause a white precipitate with gum.

Sulphate of Zinc.—White vitriol is in colorless and translucent crystals of varying size, having the form of four-sided prisms. Slightly efflorescent, but losing six-sevenths of their water of crystallization at 212°; readily soluble in water,but insoluble in alcohol. The caustic alkalies and carbonate of ammonia produce in a solution of sulphate of zinc white precipitates, soluble in an excess of precipitant. The impurities found in sulphate of zinc, are iron, copper, cadmium and arsenic. The two former may be detected by adding, to a solution of the salt, a solution of ammonia in excess, when the presence of iron will be indicated by dark or red flocculi, and of copper by the smalt blue color of the solution. Cadmium and arsenic, by acidulating the solution with sulphuric acid, and passing a stream of sulphuretted hydrogen through it, when if either metal be present, it is deposited as a yellow sulphuret.

From these it may be purified by immersing a clean plate of zinc in its solution, and exposing it to the action of air until it ceases to deposit a yellowish-brown sediment. Sulphate of magnesia from similarity of form, may be used as an adulteration. It may be recognized by an excess of caustic alkali not redissolving the precipitate which it produces in its solution.

Sulphate of Magnesia.—This salt occurs in small acicular colorless crystals, which effloresce on exposure to air. Its taste is saline, bitter and nauseous. It is soluble in its own weight of cold water, but insoluble in alcohol. The alkalies and their carbonates produce white gelatinous precipitates in solution of sulphate of magnesia, insoluble in excess of the precipitant. The most common impurity found in epsom salt is iron. This may be detected by ferrocyanuret of iron producing a greenish or blue color. When, however, the iron is in the state of protoxide, or in small amount, the coloration is not immediately evident, but will appear gradually on exposure to action of the air; the quan-

tity of ferrocyanuret used should not be sufficient to give a yellow color to the solution. Chloride of magnesium is sometimes present, and gives a deliquescent character to the salt. If, by acting on sulphate of magnesia by alcohol, and evaporating the spirit, a solid residue be obtained, this chloride may be present and then this residue dissolved in water will yield with nitrate of silver, a white precipitate insoluble in nitric acid. Sulphate of soda is detected with more difficulty. If the salt be unusually effloresecent it may be suspected. One hundred grains dissolved in boiling water and decomposed completely by a hot solution of carbonate of soda, will yield a precipitate of carbonate of magnesia, which, when washed and dried, should weigh thirty-four grains; any deficiency would indicate sulphate of soda in proportion to the amount.

Sulphate of Copper.—This salt forms translucent deep sapphire-blue crystals which effloresce slightly, becoming covered with a green incrustation; when moderately heated they lose water of crystallization, and fall into a pale blue powder. They are soluble in four parts of cold water, but insoluble in alcohol. The caustic and carbonated alkalies produce green precipitates in solution, of sulphate of copper, which are redissolved by an excess of ammonia and its carbonate. Sulphate of copper frequently contains iron, and sometimes in considerable amount. This may be detected by supersaturating its solution with liquor ammoniæ, when all the oxide of copper will be redissolved, and greenish black, or brown flocculi will be left, if iron be present. These flocculi are not distinct, if the iron be as protoxide or in small amount, the intense blue of the solution rendering them almost invisible; their presence may be set beyond doubt by filtering the deep blue solution and washing, when the oxide of iron will coat the inside of the filter with a yellow or brown film. Sulphate of zinc is said sometimes to be contained in sulphate of copper. To ascertain this, a solution of the salt is to be precipitated by solution of potassa, and an excess added by which the oxide of copper will not be touched, while any oxide of zinc will be redissolved; on filtering and adding to the clear liquid, a solution of bicarbonate of potassa or soda sufficient to convert the caustic into carbonate of potassa, white flocculi of oxide of zinc will appear. The solution of bicarbonate should be added very carefully with agitation, an

excess preventing the appearance of the precipitate, or redissolving after formation.

Sulphate of Iron.—Pure sulphate of iron is in the form of translucent rhombic crystals of a pale bluish green. In dry air it effloresces and becomes covered with a white powder, but the air being moist the color verges more or less on yellowish-brown. It is freely soluble in water, but insoluble in alcohol and strong sulphuric acid. Heated moderately it dissolves in its water of crystallization, nearly all of which gradually evaporates and leaves a white powder. At a higher temperature sulphurous acid is evolved and a subsesquisulphate formed, and finally at a red heat it loses all its acid, leaving a residue, the sesquioxide. The impurities generally found in green vitriol are sesquisulphate of iron, sulphate of copper and sulphate of zinc. Sesquisulphate of iron is indicated by the grass green hue of the salt, the depth of color increasing with amount of sesquioxide. When dissolved in water previously boiled to drive off dissolved oxygen, pure sulphate gives a white precipitate with ferrocyanuret of potassium, while the presence of a sesquisalt causes a greenish hue in proportion to the amount present. Sulphate of copper is detected by solution in water, adding an excess of solution of ammonia and filtering, when if this salt be present the filtrate will possess a smalt blue color. Sulphate of zinc is detected by the same means, and driving off the excess of ammonia by heat, when, if this salt be present, white flocculi of oxide of zinc appear. Sulphate of iron may be readily deprived of the first two impurities by agitating its solution with, or filtration through iron filings.

ON HYDRASTIS CANADENSIS.

By Alfred A. B. Durand.

(An Inaugural Essay.)

Hydrastis Canadensis.

Golden seal. Yellow root. Orange root. Yellow puccoon.

The Hydrastis Canadensis was known to the aborgines of North America, both as a medicine and as a dye. It is still used in

some parts of the country as a tonic, in the form of tincture, and in infusion as a topical application in opthalmia and ulcerous inflammations. Its late successful exhibition by some of our city practitioners in inflammations of the mucous membrane, has led me to choose it as the subject of my thesis, with a view to investigate its chemical constituents, by means of a proximate analysis.

BOTANICAL DESCRIPTION.

The Hydrastis Canadensis is an herbaceous plant belonging to the natural order of *Ranunculaceæ*, and to *Polyandria Polygynia* of the *Linnæan System*. "Its name is said to be derived from two Greek words, ιδωρ water, and αλω to act, in allusion to the active properties of the juice."

This plant is from six to eight inches in height, with a straight hairy stem, bearing two unequal leaves, the lower one petiolate, cordate, palmate, five to seven lobed, the lower one sessile and three lobed. The flower is solitary pedunculate, with three caducous reddish-white petals. The fruit is a compound berry of a red color, like that of the unripe blackberry. The root, which is the part used in medicine, is an oblong, thick and knotted rhizoma, of a yellow color, from which long fibres proceed. It has a strong narcotic odor, and an intensely bitter taste. The Hydrastis is indigenous to North America, rather rare in the Northern States, but found abundantly beyond the Alleghanies.

CHEMICAL EXAMINATION.

Two ounces of the bruised root were macerated in cold water for twenty-four hours, then placed in a displacement apparatus, and half a pint of liquid obtained. This was of a deep brown color, possessing the intense bitter taste and strong narcotic odor of the plant. Neither litmus nor turmeric papers were affected by it. Pieces of linen rags dipped in the liquid were instantly dyed of a brilliant light yellow color, which resisted to a certain degree the action of dilute sulphuric, nitric, and oxalic acids, but yielded entirely to that of hydrochloric acid.

Albumen. The presence of albumen was evinced in this lixivium, by solutions of tannin and corrosive sublimate, and also by coagulation by heat.

Gallic Acid. The muriatic tincture of iron yielded a greenish precipitate, indicating tannic or gallic acids, but solutions of quinia and of gelatin producing no change in the lixivium, it was inferred that gallic acid alone was present.

Starch. The dregs remaining on the filter were next boiled in water for about fifteen minutes and allowed to cool. To the filtered decoction, a few drops of tincture of iodine were added, which produced the color characteristic of the presence of starch.

Fatty Resin. One ounce of the powdered root was subjected to the action of sulphuric ether for a week, and then filtered. The tincture, but slightly colored, yielded on evaporation a fatty resin insoluble in water, and almost tasteless.

Yellow Coloring Matter. A tincture was made by digesting two ounces of the bruised root in eight ounces of alcohol for three days. The filtered liquor was of a reddish-brown color, less bitter than the aqueous infusion by maceration, but still possessing in a marked degree, the strong narcotic odor.

On evaporation to dryness, it yielded a fine garnet colored extract, partly soluble in water, imparting to that menstruum a brilliant yellow color.

To the alcoholic tincture a solution of bicloride of tin was added, forming a most brilliant yellow precipitate. The same test added to the aqueous infusion produced a dirty yellow precipitate, much inferior, in brilliancy of color, to that obtained from the alcoholic tincture.

Aqueous Extract. Ten thousand grains of the bruised root were macerated in cold water as long as the liquid exhibited a bitter taste. This was next evaporated on a water bath to about a pint, and filtered, to separate the coagulated albumen and oxygenated matter that had precipitated. It was again carefully evaporated to dryness, yielding a deep brown extract weighing 1920 grains.

Dry Acrid Resin. The residuum left on the filter in the above experiment, was dried at a temperature of between 90° and 100° Fahr.; then treated with rectified alcohol. A light brown colored tincture was obtained, which on being evaporated to dryness yielded 140 grains of a dry and brittle resin, of a disagreeable soapy and bitterish taste, leaving a strong acrid impression in the fauces.

Ligneous Matter. The dregs were next boiled with water, to which they still imparted the taste, odor and color of the plant, but after exhausting them perfectly, I was compelled to set them aside for several days, to attend to the duties of the store, during which time both the decoction and dregs underwent fermentation, thus putting an end to an experiment intended to ascertain the relative quantity of soluble matters and lignin existing in the root of the Hydrastis.

INVESTIGATION OF THE AQUEOUS EXTRACT.

The aqueous extract possessed the bitterness and strong narcotic odor of the plant. It was perfectly soluble in cold water, sparingly so in cold alcohol, but boiling alcohol dissolved about one-half. These solutions were all neutral and more or less colored.

The portion taken up by the alcohol evaporated to dryness yielded a garnet colored extract of intense bitterness, far surpassing that of the other half. It dissolved readily in water, to which it imparted a bright yellow color. This alcoholic extract seems to bear the same relation to the original extract that commercial ergotine does to the aqueous extract of ergot, and to contain all the active properties of the plant combined with the coloring matter.

Sugar.—The portion of the aqueous extract not taken up by the alcohol was black, affording with water a dark-brown solution much less bitter and odorous than the other; subjected to a strong heat it was decomposed, emitting the peculiar odor of burnt sugar.

500 grains of the aqueous extract were dissolved in eight ounces of water, to which 125 grains of magnesia were added, and the whole digested on a sand bath for two hours; then filtered, and the residuum washed with water and dried. This was digested in boiling alcohol and afterwards filtered. The liquor was now set aside to evaporate spontaneously and afforded after twenty-four hours, beautiful four-sided prismatic crystals terminated by pyramidal summits. These were separated from the mother-liquor which after a few days yielded a new crop of crystals larger than the former, but of a prismatic tabular form.

125 grains of the same extract were dissolved in four ounces of water, and the solution treated with basic acetate of lead until it ceased to produce a precipitate. This was separated by filtration,

and the liquid portion submitted to a stream of sulphuretted hydrogen, to eliminate the lead. The supernatant liquor was evaporated to dryness, in order to get rid of the excess of sulphuretted hydrogen, and the acetic acid left by the decomposition of the salt of lead. The extract thus obtained treated with boiling alcohol, yielded by spontaneous evaporation an extractive matter intermixed with crystals resembling those obtained by magnesia, but which I did not succeed in isolating. [Acetate of Hydrastia?—Ed.]

125 grains of the aqeous extract were again dissolved in four ounces of water, and one ounce of animal charcoal was digested with the solution for about six or eight hours. It was then filtered and the residuum washed and dried. This was then treated with boiling alcohol, which on spontaneous evaporation produced an extractive matter of intense bitterness, also intermixed with crystals identical with those of the preceding experiment.

EXAMINATION OF THE CRYSTALLINE SUBSTANCE.

The first crystals were of brilliant yellow color, insoluble in water, sparingly so in cold ether and alcohol, more so in ether when hot, entirely dissolved by chloroform and boiling alcohol.

Litmus paper previously reddened by an acid immersed in these solutions was restored to its natural blue color. Nitric acid dissolves the substance perfectly, decomposes it, and assumes a deep red color. Muriatic acid dissolves it without alteration; sulphuric acid affects it slightly when cold, but when hot decomposes it, and becomes changed in color to purple. Vapor of iodine changes the crystals to a deep brown color; heated in oil of turpentine they fuse, somewhat coloring the oil, and a slight opacity occurs when the solution cools. Water and alcohol acidulated with sulphuric, nitric, hydrochloric, acetic, and oxalic acids dissolved them perfectly, gradually diminishing the acid reaction, but not however completely so.

These solutions were intensely bitter, and on evaporation yielded amorphous white granules, the mother water which covered them changing to an oily viscous fluid, of a bitter acrid taste, which was ultimately converted into a brittle and transparent resinous mass of an amber color. All these solutions were precipitated by ammonia and tannic acid. Subjected to the blow pipe flame in a platinum capsule the crystals burned with a yellow flame, puffing

up in a carbonaceous mass, which disappeared entirely by protracted heat, proving them to be of organic origin.

Two grains of the crystals were next mixed with thirty grains of caustic potassa placed in a test tube and submitted to the flame of a spirit lamp, when the odor of ammonia was soon made sensible, proving the presence of nitrogen. The second crop of crystals were different, as before mentioned, in the form of crystallization and in color only; in all other respects they were identical with the first. All the experiments are not sufficiently conclusive to pronounce on the nature of the crystals. They certainly possess many characteristics of organic bases, such as to contain nitrogen, to restore the blue color to litmus paper previously reddened by an acid, to dissolve in acids, and be precipitated from their solutions by ammonia and by tannin; but so far, I have not been able to reach the most important point, that is, to obtain crystals from their solutions in acids, nor to experiment on the amorphous granules yielded by the evaporation of their solutions with the view to ascertain whether they were formed by the combination of an acid with a base, or merely the substance itself deposited by evaporation from a mere solution in an acid. For the present I shall therefore call the substance *Hydrastin*, with the hope that I will be more successful, after repeating my experiments on a larger scale, in fully establishing its rank among the alkaloids, and in conformity with our nomenclature change its present name of Hydrastin to that of *Hydrastia*.

EXAMINATION OF THE ASHES.

Potassa. One thousand grains of the bruised Hydrastis were incinerated in a covered crucible, and forty-four grains of ashes obtained. They were first treated with boiling water, to a portion of which a solutionof tartaric acid was added; no effervescence was manifested, and a crystalline precipitate of bitartrate of potassa was revealed. The presence of potassa was further confirmed by producing precipitates on the addition of solution of nitrate of silver and bi-chloride of platinum. Oxalate of ammonia rendered the liquor slightly turbid. Ferrocyanide of potassium did not evince the presence of iron.

Carbonate of Lime.—The insoluble portion remaining on the filter, was then treated with boiling water acidulated with hydro-

chloric acid producing a brisk evolution of carbonic acid. On the addition of oxalate of ammonia a copious precipitate of lime was instantly produced.

Iron.—With the ferrocyanuret of potassium a deep blue color was evinced, indicating the presence of iron.

Alumina.—A solution of ammonia produced a gelatinous precipitate insoluble in excess of the alkali, but soluble in caustic potassa, evincing the presence of alumina. As this substance is of rare occurrence in a vegetable analysis, I am inclined to believe that it was furnished by the earth attached to the root.

Magnesia.—Phosphate of soda produced a cloudiness immediately precipitated by the addition of ammonia revealing the presence of magnesia. From the above experiments, the constituents of the root of the Hydrastis Canadensis may be summed up as follows: Albumen, gallic acid, starch, fatty resin, yellow coloring matter, extractive matter, dry acrid resin, ligneous matter, sugar, *Hydrastin*, potassa, iron, carbonate of lime, and magnesia and alumina probably in the state of phosphate. The inference to be drawn from the above analysis by the practitioner of medicine, is that the *Hydrastis Canadensis is not, properly speaking, an astringent remedy*, as it seems to have been considered to this day, but that *it acts in the manner of certain narcotic bitter substances*, by soothing irritation, giving tone to the mucous membranes, and producing a healthy reaction. I know nothing of the activity of the crystalline principle hydrastin, not having had as yet occasion to have it tried by the practitioner of medicine, but I would recommend, in preference to any other preparation of the root, the alcoholic extract obtained from the aqueous extract, as it seems to possess in a high degree all the active properties of the root in a concentrated form.

Whether I have contributed to enrich the materia medica by this analysis, and vegetable chemistry by the addition of a new organic principle is yet to be decided, but I have every reason to believe that the coloring matter of the Hydrastis will prove to be useful in the arts as a dye It imparts to linen a rich and durable light yellow color of great brilliancy, which might probably by proper mordants, give all the shades of that color, from the pale yellow to the orange. The lake produced by the bi-chloride of tin might also prove a useful pigment in oil and water painting.

FLUID EXTRACT OF SERPENTARIA.

By John B. Savery.

(An Inaugural Essay.)

The Virginia snake-root has, since its first introduction into the materia medica, been regarded as a valuble remedy in some forms of disease, but its use has in some measure been confined to domestic practice, and it has received less attention from members of the medical profession than its merits would seem to demand.

Growing as it does in great abundance in our own country, a supply of it is always on hand without those difficulties, which, under some circumstances might attend the introduction of foreign drugs. In the treatment of all cases in which our indigenous plants may be substituted for those of foreign origin, there is an obvious advantage in their employment from the reason above stated, viz., the uniformity and certainty of the supply.

Under these circumstances, and with a view to the increasing use of Serpentaria, it becomes a matter of some consequence to determine upon the best mode of administering it. The United States Pharmacopœia directs a tincture of the strength of one and a half ounces to the pint; but this, although in some cases it may no doubt be properly employed, is liable to objections. The quantity of alcohol necessarily taken, in order to produce the effect of a full dose of the root, might, under some circumstances, have an injurious tendency.

The favorable opinion which is entertained by the medical public of some of the fluid extracts which have within a few years been introduced into the list of pharmaceutical preparations, has induced me to undertake a series of experiments with a view of ascertaining whether a similar extract could be prepared from Serpentaria, which would be without the disadvantages above mentioned as appertaining to the tincture.

The principles upon which the virtues of this drug depend, are stated to be resin, bitter extractive, and volatile oil; the latter existing in such extremely minute quantity (1-20th of one per cent) as to render it very doubtful whether it has any effect on the system. In order to obtain an extract which should contain in a concentrated form, the whole of the two first mentioned principles,

with as little loss of the volatile part as possible, a number of methods were tried. The individual details of these experiments it is unnecessary to mention, but the opinion formed from their general results was that the most simple mode of operating, was the best, and that on extract made by the following formula, was the most perfect preparation:

Take of Virginia Snake-root,
Sugar in powder, each eight ounces.
Water,
Alcohol, each a sufficent quantity.

The root is to be finely ground, and after having macerated for a day or two in a pint of alcohol, is to be introduced into a displacer, and diluted alcohol poured on it until four pints shall have passed. The tincture thus obtained should be evaporated with a gentle heat and constant agitation until it measures twelve fluid ounces. The sugar is then to be dissolved, and the whole to be strained through flannel.

The object of using strong alcohol for obtaining the first portion is to insure the solution of the whole of the resin, some of which might be left behind if the whole of the menstruum contained a proportion of water.

If any separation of resin or other matter should occur during the process of evaporation, which is sometimes the case, it will generally be suspended or redissolved on the addition of the sugar.

By the exercise of a reasonable amount of care in evaporating, the dissipation of the volatile principal can, in a great measure, be avoided, for a specimen of the extract prepared as above, was found to possess little or no power of imparting any of its original peculiar properties to ether, boiling water, or other menstruum, thus proving that the virtues of the root were all extracted by this mode of treatment.

Serpentaria being often employed in combination with other substances as cinchona, gentian, &c.; an extract might be made containing their activity, by varying this mode of preparation in accordance with the peculiar characteristics of the drug to be combined with it.

The dose of this extract will, of course vary according to the nature of the case in which it is used; it should not, however, be

administered in doses much larger than half a drachm each, two fluid ounces of it containing the activity of one ounce of the root.

It may be observed that in the selection of serpentaria for this or indeed, any preparation, care should be taken to have it free from *ginseng* or any of the other accidental foreign matter, so frequently found in the bales of the commercial article.

PRACTICAL OBSERVATIONS.

By R. H. Stabler, Alexandria, Va.

Believing the result of some observations made while engaged in the daily duties of a practical pharmaceutist might be acceptable to the readers of the Journal, and in hopes that they may elicit similar communications from others engaged in the profession, is my excuse for penning the following essay.

Powdered Drugs. The facility of adulterating powdered drugs so as to escape detection, is a strong temptation to many wholesale dealers and drug grinders to furnish inferior articles at a less price than the pure articles can be obtained for; for this reason many retailers and dispensers prefer selecting drugs in their crude state, and powdering them when wanting; thus avoiding the liability to deception. Being in this practice, I have observed an easy method of obtaining powdered squill root. This drug can be powdered to better advantage in cold weather; if kept in a dry atmosphere of about 90° F. for three days, it becomes brittle, dry, and easy to reduce to the requisite degree of fineness. My method has usually been to run it through Swift's drug mill first, sift it, then finish in the mortar and spring pestal; lastly, bottle in perfectly dry and warm bottles, cork and hermetically seal them, then cover with blue paper to prevent the injurious action of light.

Powdered Opium, is seldom prepared from the best gum, and I believe it is more difficult than any article in the materia medica to obtain ready powdered of the wholesale dealer, of good quality. The custom with a great many, is to select the

best pieces for sale, and use the inferior sort, together with capsules and dregs of the case, for powdering. Every dispenser ought to powder his opium, and if he will select cold weather for the operation, it is attended with little difficulty: slice the opium in thin pieces and expose it in the drying chamber, to a temperature of about 100° F., until it becomes brittle and easy to reduce, and protect the powder when finished in the manner described for powdered squill root.

Powdered Ergot is so liable to decomposition that many druggists do not keep it ready for dispensing, preferring to powder it fresh when called for. It is often of the greatest importance that it should be furnished expeditiously. In uterine hemorrhage after delivery, for instance, where a few moments may determine the result in life or death, impressed with the importance of being able to keep it on hand, and to protect it from change, I was glad to adopt the following suggestion met with in Dr. Dunglison's work on new remedies, and have found it entirely successful. "To prevent the formation of the parasites, Mr. Rawle keeps a small piece of camphor in the stopper bottle which contains the ergot. This soon annihilates the whole race of insects, and adds greatly to the certainty of the effect of the medicine. This plan had been recommended before by Dr. Bright. It has been advised that the camphor should be admixed with the ergot in the proportion of a grain to a scruple."

In adopting this suggestion I have found it sufficient to introduce camphor,* tied up in a piece of muslin; the whole mass soon becomes pervaded with the smell. Whole ergot is effectually protected from the acarus by adopting this plan.

Tincture of Chloride of Iron, prepared by the present formula speedily undergoes change, depositing peroxide of iron, and depreciating in strength. This is effectually prevented by adding a portion of honey, and less alcohol, to preserve the officinal strength. The following modification of the officinal formula I have made use of for some time past, and find it to yield a permanent preparation, viz.:—

*In another part of this number, a suggestion to employ chloroform to *kill* and preserve cantharides will be found. We think that chloroform vapor would act with equal effect on the depredators of ergot.—EDITOR.

Take of Subcarbonate of Iron,	6 ounces
Muriatic acid,	1 pint,
Alcohol,	2 do.,
Strained honey,	1 do.

Pour the acid upon the subcarbonate of iron, and shake the mixture occasionally for three days; then set by, that the dregs may subside; lastly pour off the liquor and add to this the alcohol and honey previously mixed.*

Ointment of Red Oxide of Mercury soon loses its fine red color, as ordinarily prepared. To remedy this it has been suggested to prepare the simple ointment or lard by digesting it on poplar buds; or to dissolve a portion of benzoic acid in it, both of which methods are effectual, but attended with some trouble. A more simple and equally effectual method is, to add two drops of liquor potassæ to each ounce of the freshly prepared ointment.†

Tincture of Kino. Having experienced the difficulty of preserving this tincture from undergoing change in constitution,

* We dissent from the author in regard to the presumed advantages presented by the above formula. It was the design of the originators of the preparation to get a sesquichloride of iron in alcoholic solution. The Dublin Pharm: (1826) directs rust of iron. The Edinburgh Pharmacopœia, 1841, directs red oxide of iron. The Codex directs sesquichloride of iron to be dissolved in alcohol. The new Dublin Pharmacopœia, the latest British Pharmacopœia published, directs a solution of sesquichloride of iron to be made by dissolving iron wire in muriatic acid, and converting the protochloride of iron into sesquichloride, by adding nitric acid. The only reason for using subcarbonate of iron, is, that it is the most convenient and most soluble form of sesquioxide, obtainable. The reason the tincture precipitates, is because a small quantity of protochloride of iron is formed from the four or five per cent of carbonate of the protoxide that the subcarbonate contains, and this is slowly converted into sesquichloride and sesquioxide, which precipitates. The Pharmacopœia U. S. for 1850, gives a process for making this preparation in as many hours as that of 1840 requires days. Hence the design of the author in employing honey is of little use, and accomplishes nothing beyond preventing the decomposition of a little protochloride of iron, which had better be absent than present.—EDITOR.

†The same preservative effect is derived from liquor potassæ, when added to iodide of potassium ointment—the elimination of free iodine and consequent coloration of the ointment, being prevented by the alkali.—EDITOR.

and from gelatinizing, when prepared by the U. S.* process, I determined to adopt the suggestion of Benjamin Canovan, in the American Journal of Pharmacy for 1849, and can say it has proved entirely successful.

If prepared with diluted spirit as proposed, instead of rectified spirit, which is in the officinal formula, I believe it is as permanent as any of our vegetable tinctures. A sample of tincture of kino, made more than seven months ago, has yet shown no tendency to gelatinize.

ON A NEW SOLVENT FOR EXTRACTING CANTHARIDIN, AND ON THE EXISTENCE OF THAT PRINCIPLE IN CANTHARIS VITTATA AND MYLABRIS CICHORII.

By William Procter, Jr.

The remarkable solvent power possessed by chloroform that has already been developed, and especially the discovery of Rabourdin, that some of the vegetable alkalies come within its capacity, led me to query whether it would not also dissolve the active principle of cantharides. On making the trial with some pure cantharidin it was found to dissolve it with great readiness.

An ounce (480 grs.) of Spanish flies in powder, and two ounces of chloroform, were macerated together for forty-eight hours, and thrown on a glass percolator, the diaphragm of which consisted of a thick sheet of lint, and fitted with a cover to prevent loss by evaporation. The superior density of the menstruum causes the flies to float in it, for which reason it is better, after the solution has

*The author probably means the *London* process, as it is not officinal in the U. S. P., 1840, though introduced into that for 1850 with diluted alcohol as a menstruum. Notwithstanding the testimony of the author and Mr. Canovan, experience has abundantly proved that the fault lies in the nature of the kino-tannic acid, which will change by exposure to air, and lose its astringency. Diluted alcohol may render the process less rapid—but a bottle now on our own shelf made with that menstruum, is as completely gelatinized as a mass of crassamentum. The closer the shop bottle, is stopped, the slower will the change occur, and when hermetically sealed, we have kept it eight years without loss of fluidity or astringency.—Editor.

drained off, to place a heavy diaphragm on the flies, and return the solution to the percolator; after it had passed a second time, a little chloroform was added, and finally alcohol .835, until all the first menstruum has passed, which is known by the difference in density and color of the alcoholic liquid, which contains the brown color left by the chloroform.

By spontaneous evaporation, the dark green chloroform solution yielded a crop of crystals of cantharidin, admixed with the green fixed oil peculiar to the insect; the whole residue weighed 43 grains. After standing 48 hours, that the crystals should have time to separate, the whole was thrown on several thicknesses of filtering paper to absorb as much as possible of the oil. The crystals were then dissolved in a mixture of chloroform and a little alcohol, and by spontaneous evaporation were obtained in nearly a pure form.

The particular merits of chloroform as a menstruum in making cantharidin, are, that it is a better solvent than ether or the oils; that a less quantity can be used with more effect, employing alcohol to displace it, and that the cantharidin crystallizes more readily from chloroform than from ether. The expensiveness of chloroform precludes its use in the preparation of the ordinary blistering liquids, or tissues, but where the object is to isolate the cantharidin, the advantages above mentioned, together with the fact that most of the chloroform may be regained by distillation, will render its use altogether eligible.

Cantharis vittata.—Not being aware of any chemical examination of this insect with a view to demonstrating the existence of cantharidin in it, I have applied the solvent property of chloroform to this purpose. One hundred and twenty grains of the flies, reduced to powder, were percolated with chloroform, slowly added, until three times the weight of the flies had passed, The tincture had a greenish brown color, the brown predominating. A few drops of this by evaporation on glass, deposited a coating of minute crystals visible to the eye, and their shape discoverable with a common lens. The whole of the chloroform solution was then suffered to evaporate in a suitable vessel, and yielded a residue of 12 grains. This consisted of crusts of minute crystals admixed with a greenish brown fixed oil, the latter in much less quantity than the green oil obtained in the same manner from Spanish flies.

The whole was laid on thick filtering paper to absorb the oil, the crystalline matter dissolved in a little chloroform and alcohol mixed, which by spontaneous evaporation yielded it in a much purer form, though not entirely colorless. The cantharidin appears to be associated with less fixed oil in the potato fly, than in the Spanish insect; the oil has much less color and is more fluid. The cantharidin separates in sword shaped prisms, terminated obliquely.

Mylabris cichorii.—Having in my possession a specimen of the Chinese blistering fly, Mylabris cichorii, the same trial was made with it. One hundred and twenty grains, in powder, was percolated with chloroform till exhausted. The solution possessed a deep brown color, without a tinge of green. A few drops evaporated yielded a crop of crystals admixed with a transparent brown oily matter. The crystals were larger than those yielded by either of the preceding flies under the same circumstances. The tincture was then suffered to evaporate spontaneously, and yielded an oily crystalline residue, weighing 14 grains. The crystalline matter was separated from the brown oil by absorption with filtering paper, and was purified in the same manner as in the preceding experiments. The crystals corresponded in shape with cantharidin from the two varieties of cantharis.

In stating the weight of chloroform extract obtained from each of the three species of insects examined, no conclusive evidence can be drawn relative to their activity, as in the two first experiments the flies were not exhausted. Besides the amount of oil and coloring matter varies, and as the whole of the cantharidin in neither case was isolated from the extract, its absolute amount is undetermined. The fixed oil must be well pressed out from the crystals before purifying them by recrystallization.

In order to feel assured that the substances obtained were really the blistering principles of the insects, a small quantity of each mixed with a little oil was applied to my arm, and left on for eight hours. Vesication had occurred before their removal in each instance, but more perfectly with the Spanish and Chinese flies than with the indigenous variety, owing, as was afterwards observed, to the crystals of cantharidin in the latter substance not being properly comminuted and disseminated through the oil. On the application of cerate, however, they were all equally developed.

ON THE EXTRACTION OF CHLORIDE OF SODIUM FROM THE SALT GROUNDS OF THE CAPE DE VERD ISLANDS.

By J. Coleman Morgan.

As is well known, the Cape de Verd Islands have a soil highly impregnated with salt. The amount of impregnation varies in the different islands, and it is worthy of remark that it is greatest in those whose surface in nearly flat. For instance, the mountainous region of St. Jago, (whose principal town, Port Prayo, is the rendezvous of coast-bound vessels,) affords a quite pleasant and tolerably pure water, which is conveyed to a spot near the sea-side for the use of ships and the inhabitants; while, in the flat country of the Isle of Sal, there is no fresh water whatever, and its 200 inhabitants are obliged to obtain supplies of brackish water by boats which ply daily to the Isle of Bona Vista, which is in sight and of some elelevation. The Isle of Sal, (the main salt ground) as are all the group, is peopled, to some extent, with Portuguese convicts, who, under the control of an overseer, work in the salt fields. These require description. They are each about one-half a mile square, and are surrounded by embankments, of which one, running through the whole, supports a railway used for the purpose of transportation. In each field, are a number of artificial springs or wells furnished with wooden pumps of very rough construction, standing 100 or 200 feet apart. These pumps have attached to their several piston rods, a crank, &c., connected with a kind of windmill, with sails of thin wood, of only about 12 feet diameter, but which, impelled by the great force of the N. E. trade-wind that is blowing constantly, raise many gallons of water in a short time. As this is discharged, it is conducted by troughs, dug to the depth of a few inches in the earth, into vats, which I found by measurement to be 17 feet long, by 6 wide, and 10 in. deep. These are allowed to fill, the supply is cut off, and the salt is allowed to crystallize by the evaporation of the fluid portion of the brine. The brine (whose strength, however, I did not determine more closely) contains, I judged, about twenty per cent of the salt, and it may well be supposed, is intensely acrid to the taste

The contents of the vat having commenced to crystallize, the process is hastened by frequent agitation with a wooden hoe, and the salt when formed is dried and thrown up in heaps on the embankments for transportation. When this is required it is transferred by the workmen to large boxes set on truck cars, drawn into the town by asses, and deposited near the sea-side in extensive heaps. From these the droghers are loaded; the salt being conveyed in boats which receive it at the end of a wharf, which is composed of the wreck of an old barque, (the Ariel, of Boston) extending through and beyon the surf. Some other of these islands also furnish quantities of this commodity, but none so much as that just spoken of.

ON THE VOLATILE OIL OF NUTMEGS.

By G. G. Mitscherlich.

From a series of experiments with ol. nucistæ æthereum on rabbits, Mitscherlich draws the following conclusions:—

1. The volatile oil of nutmegs is a strong poison; for six drachms of it killed a middle-sized rabbit in the space of 13½ hours; two drachms killed a strong rabbit within five days; one drachm killed a small rabbit in about thirty hours; one drachm of the oil injected into the stomach of a full-grown rabbit made it sick and ill for several days, after which it recovered. The volatile oil of nutmegs is weaker in its action than the oils of mustard, savine, and caraway, and is stronger than the oils of fennel, lemon, turpentine, juniper and copaiba, but is nearly equal in strength to the oil of cinnamon.

2. The oil of nutmegs is absorbed, and appears to undergo a change in the blood, and passes out in this altered condition in the urine, to which it imparts a peculiar, pleasant, aromatic odor. Neither the natural odor nor the changed odor could precisely be discovered in the blood or in the breath.

3. The oil of nutmegs produces in the stomach and jejunum a similar alteration of structure to that of the oils of caraway, fennel, lemon, turpentine, juniper, copaiba, bitter almonds, and cinnamon. In the stomach extravasation of blood and formation of blood-vesicles on the mucous membrane, which was partly softened and devoid of blood, without being inflamed in the adjacent parts. The interior of the duodenum was much divested of epithelium and filled with mucus. In the first experiment, with the enormous dose of six drachms, the stomach and the jejunum were injected with blood.

4. The most important symptoms of poisoning were frequent and powerful pulsation of the heart; slight acceleration of breathing; at first restlessness, afterwards weakness of the muscles, but considerably less than from oil of cinnamon; little or no diminution of sensibility, evacuation of hard fæces from the colon: ejection of a peculiarly smelling sanguineous urine after smaller doses, but no increased diuresis; decrease of strength and of the pulsation of the heart; difficult breathing; diminished heat in the external parts; death without convulsions. Death was produced by the absorption of the volatile oil.

Effect of the Oil of Nutmegs upon the Skin of the Human Body.—Part of the dorsal surface of the hand was moistened with the volatile oil of nutmegs. After about four minutes a very slight burning sensation was felt, which gradually increased, so that after fifteen minutes it became very unpleasant, and on being touched the reddened spot caused much pain. After thirty minutes the moistened spot was red; it burnt like after a sinapism when the skin is moderately reddened. Upon being washed the burning sensation disappeared within an hour; the epidermis did not scale off. In a second experiment with another individual, the symptoms were much slighter, the burning appeared only after ten minutes, and became rather strong after another ten minutes; the hand being then washed after thirty minutes, the burning sensation was still very intense, but the skin was not red. The burning sensation continued for about half an hour: the epidermis did not scale off.—*London Phar. Jour. Jan.* 1, 1851.—*From Buchner's Rep.*, vol. xvi. 1851, p. 104.

ON THE CHEMISTRY OF ASSAFŒTIDA.

By Hlasiwetz.

If assafœtida be treated with strong alcohol, the resin and volatile oil are completely dissolved, the gum and impurities (consisting chiefly of gypsum) remain behind.

From the alcoholic tincture, the alcohol and volatile oil may be separated from the resin by distillation, so that the latter remain behind almost inodorous. If the distillation be performed with water in a copper still with a tin head, the tin becomes strongly acted on by the sulphur contained in the volatile oil. The distillation was, therefore, afterwards undertaken in a large glass retort, heated in a salt-water bath, in order to avoid the burning of the residue.

One pound of assafœtida of the best quality yielded, on the average, one ounce of volatile oil, equal to about three [6 ?] per cent.

The volatile oil of assafœtida is a thin fluid of a light yellow, clear, and of a penetrating smell. It is very readily dissolved by strong alcohol; water also takes up a considerable quantity of it, from which reason the *aqua assafœtidæ* is particularly rich in oil, and has an acrid taste. Hlasiwetz found also valerianic acid and metacetonic acid in it. The volatile oil of assafœtida does not redden the skin as some other oils do which contain sulphur; it is also neutral to test paper. After it has stood for some time it evolves a large proportion of sulphuretted hydrogen; this property it imparts to crude assafœtida. It does not congeal by artificial cold. Its boiling point cannot be exactly determined, for when heated, it developes, before and during boiling, sulphuretted hydrogen, and becomes thus decomposed. This boiling, however, takes place at 130° to 140° C. When fresh, it consists of carbon, hydrogen, and sulphur, without oxygen; but if exposed for some time to the atmosphere, it becomes slightly acid, and its odor is slightly altered.

Repeated analyses of the crude volatile oil, have shown that its per centage composition varies with the method of obtaining it, and according to its age; the carbon varied from 64.24 to 69.27; the hydrogen from 9.09 to 10.48; the sulphur from 20.17 to 25.43 per cent., so that according to these results, a compound of

a higher and of a lower proportion of sulphur with one and the same radical, may be calculated according to the following formulæ :—

I.	II.	III.	IV.
$C_{12} H_{11} S_2$	$3 (C_{12} H_{11} S_2)$	$5(C_{12} H_{11} S_2)$	$C_{12} H_{11} S_2$
$C_{12} H_{11} S$	$C_{12} H_{11} S$	$2 C_{12} H_{11} S$	$2(C_{12} H_{11} S)$

Dr. Hlasiwetz has examined the relations of this oil to various agents, *e. g.*, ammoniacal gas, liver of sulphur, muriatic acid, chlorine gas, nitric acid, chromic acid, sulphurous acid, potassium, lime, soda, oxide of silver, oxide of lead, and chloride of platinum, and analyzed most carefully the numerous results he obtained.

The resin of assafœtida is dirty white; in the air it soon becomes pink-red; in concentrated sulphuric acid it is dissolved with a green color; water throws it down from this solution in the form of pink-red flocculi; heated in a retort, it loses first the water adhering to it and a small quantity of volatile oil, which possesses a smell of assafœtida. At the same time it froths much, and develops sulphuretted hydrogen. As soon as all the water is expelled the froth disappears, the resin becomes dark-brown and boils steadily. The oils which now distil over during the decomposition of the resin are partly green, blue, violet-red, and of a more or less aromatic smell; diluted caustic potash lye is colored yellow by them and becomes turbid. The violet portion communicates to the potash lye an oil, which becomes intensely red in the air. The potash liquor with which the oils have been washed, contains, besides sulphuretted volatile oil, chiefly formic acid, and a trace of acetic acid.

The gum of assafœtida is, when dry, grey and horny, and yields, by dry distillation, formic acid with a small quantity of acetic acid and a kind of tar, containing sulphur.

Formic acid and acetic acid were also obtained by treating the red volatile oil of assafœtida with caustic soda. Valerianic acid and metacetonic acid could not be discovered in it. But upon heating the soda-lime in the oil-bath to 200° C., and allowing the volatile oil to drop on it, a volatile oil of a smell similar to lavender was formed, and valerianic acid, together with metacetonic acid

and acetic acid remained behind in combination with the soda, lime.—*London Phar. Jour. Jan.* 1, 1851.—*From Buchner's Rep.*, No. xvi., 1851, p. 83.

MEANS FOR KILLING, AND PRESERVING CANTHARIDES.

By M. Lutrand.

Instead of killing these insects by the use of vinegar, which necessarily extracts a certain quantity of their active portion, M. Lutrand recommends that the flies be introduced into a deleterious atmosphere. He employed successively carbonic acid, sulphurous acid, chlorine, nitrogen, hydrogen, ammonia, empyreumatic oils, the volatile oils of the Labiateæ, camphor, naphthalin, creasote, valerian, chloroform, ether, aldehyd, &c. and determined with care the mode of action of each of these substances.

The author was particularly pleased with the effects of chloroform. This agent kills all insects that respire its vapor, with a remarkable promptitude, and much difficulty is presented so to graduate its effect that they will revive afterwards.

This being the case he feels himself authorized to say, that if the recommendation of a physician of Pont-de-Vaux, (Avril 1849) to employ chloroform to asphyxiate bees when collecting the honey, be followed, there will be a danger of killing them ; and he asks whether in this case the use of carbonic acid gas would not be preferable.

This gas produces but a momentary suspension of animation in cantharides. They fall into a sort of sleep or torpor which passes off when they are exposed to the air. This revivification occurs with equal readiness after the cantharides have remained in the gas a long time.

M. Lutrand also recommends chloroform as a means of preserving cantharides, and he considers it superior to any substance that has hitherto been recommended for this purpose. He considers it worthy of a place among the appliances used by the collector of insects, and the preparer of specimens of natural history.—*Journal de Pharmacie, Sept.* 1850, *from Acad. des. Sci. de Montp.*

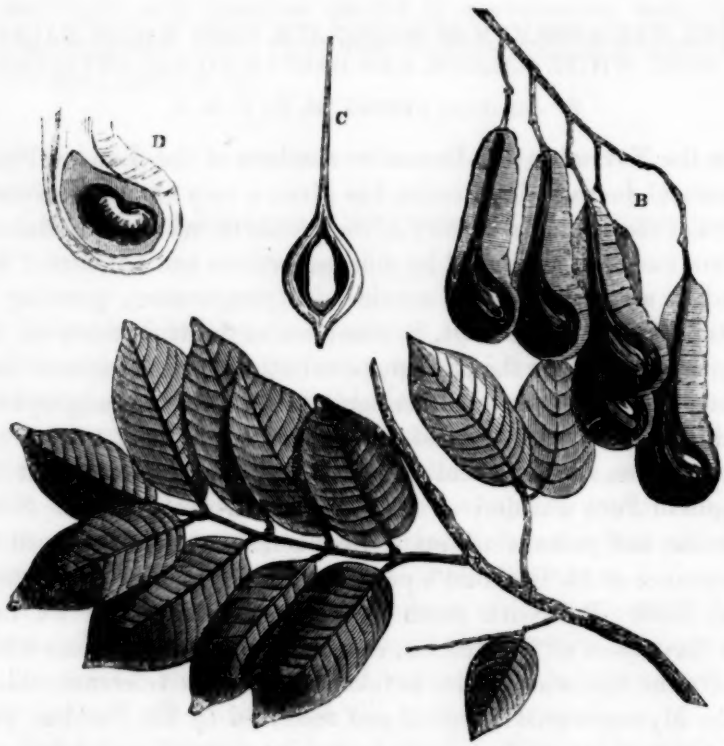
ON THE MYROSPERMUM OF SONSONATE, FROM WHICH BALSAM OF PERU, WHITE BALSAM, AND BALSAMITO ARE OBTAINED.

By Jonathan Pereira, M. D., F. R. S.

[In the November and December numbers of the London Pharmaceutical Journal, Dr. Pereira has given a very elaborate investigation of the botanical history of the plants to which the Balsam of Peru has been attributed by different writers and botanists; followed by a description of a species of Myrospermum, growing in Central America, which Dr. P. considers as the true source of the drug, and which, for the present, he calls the Myrospermum of Sonsonate, the specific designation being taken from the geographical locality of the tree. We had, in common with most others who had not given special attention to the subject, presumed that the Balsam of Peru was derived from the north-west part of South America, and perhaps originally from some part of Peru, until the appearance of M. Guibourt's paper in the Journal de Pharmacie, Feb., 1850. It is with much interest, therefore, that we have read the papers of Dr. Pereira, especially the last one, from which mainly the following notice is taken, which has reference chiefly to the Myrospermum received and described by Dr. Pereira, from Mr. Skinner, late of Guatemala; referring those of our readers who may desire to investigate the botanical details of the subject, to the original papers in the Pharmaceutical Journal.—Editor.]

In the last number of the Pharmaceutical Journal I stated, that I had received from Sonsonate a species of Myrospermum, from which Balsam of Peru, White Balsam, and Balsamito are obtained. I then believed the plant to be identical with that figured by Lambert, and which according to both Kunth and De Candolle is *M. pubescens*. A careful examination of the specimens in the British Museum, from which Lambert's figures were drawn, has led me to doubt the identity of his plant either with the Sonsonate species or with the *pubescens* of Kunth and De Candolle. For the present, therefore, I shall designate the plant which I have received, the "*Myrospermum of Sonsonate.*"

The specimens of the *Myrospermum of Sonsonate*, which I have received, consist of branches, leaves, and fruits. The flowers I have not met with.



The Myrospermum of Sonsonate. [About one third the natural size.]

A. Leaf-bearing branch.
B. Fruit-bearing branch.
C. Vertical section of the fruit.
D. Lateral section of the fruit, showing the seed *in situ*.

From specimens in my possession, received from the Balsam coast by Mr. Skinner.

The *branches* are terete, warty, but otherwise smooth, ash-colored or ash-brown.

The *leaves* are alternate, petiolate, and impari-pinnate. The common petioles appear to the naked eye devoid of hairs, but when examined by the microscope are found to be covered with a few short hairs.

The *leaflets* are from 5 to 11, alternate, with short petioles. Exclusive of footstalk, their length varies from about 2 to 3½ inches; and their width, at their widest part ,from 1 to 1½ inch-

The most usual size is 3 inches in length, and $1\frac{1}{4}$ to $1\frac{4}{10}$ inches wide. Their general shape is oblong or oval-oblong, in some cases ovate. They are rounded or very slightly tapering, not cordiform at the base. Superiorly they contract abruptly into an emarginate point. To the naked eye the partial petioles and midribs appear devoid of hairs; but when examined by the microscope, short lymphatic hairs, having a glossy or resinous appearance, are distinctly visible on them; and the partial petioles appear somewhat rough from transverse rugæ. The leaflets are elegantly marked by rounded and linear pellucid spots; the lines being usually parallel with, or in the direction of, the primary veins. To see the spots, the leaflet must be held up against a strong light and examined by a magnifier.

The *fruit* is a one-celled, one-seeded, winged, indehiscent pod (called by some a samara, by others a samaroid legume.) The fruit-stalk is naked at the base, but is amply winged superiorly. The fruit, including the winged foot-stalk, varies in length, from about 2 to 4 inches; the usual length is $2\frac{1}{8}$ to $3\frac{1}{4}$ inches. At the peduncular extremity, the fruit (or rather its winged foot-stalk) is rounded, or very slightly tapering, unequal-sided; at the summit it is enlarged, tumid, and rounded, with a small point (the remains of the style) at the side. The mesocarp is fibrous; but immediately exterior to the endocarp it contains in receptacles a yellow oleo-resinous or balsamic juice, which, by age, hardens and resinifies. Ruiz, Kunth, Endlicher, and De Candolle, describe this juice as immediately surrounding the seed, and being between the seed and the lining (endocarp) of the shell: but this is a mistake, it is exterior to the endocarp. The principal part of the balsam resides in two receptacles or vittæ, one placed on either side; but if a transverse section of the fruit be examined by the microscope, numerous receptacles of the more or less dried balsam are perceived in all parts of the mesocarp. In the two larger recep-

Cross section of the fruit and seed. (Magnified.)

a a Epicarp.
b b Mesocarp.
c c Endoscarp.
d d Large vittæ or lacunæ containing balsam.
e e Cotyledons.

tacles the balsam is usually found in the liquid state; but sometimes the walls of the receptacles are lined with the crystallized balsam (Myroxocarpine). That the balsam resides in the mesocarp and not in the cavity of the fruit is proved by the cross section, which shows that the paries of the cavity of the fruit is continuous with the two sutures. The seed lies loose and dry in the cell of the pericarp; and is covered by a thin, white, membranous coat, (testa?) The cotyledons are yellowish and oily, and have an agreeable odor like that of the tonka-bean or melilot, and a bitter taste somewhat resembling that of the bitter almond. By digesting the seeds in ether, a tincture is obtained, which yields on evaporation a very agreeable smelling, amber-colored, soft, extract, whose odor resembles that of the tonka-bean or melilot.

Some of the fruits which I gave to Mr. Alfred Smee were sown by him in a pot, and placed in his hot-house. Several of them have produced thriving plants. A leaf of one of the plants thus raised consists of 5 alternate leaflets marked with pellucid dots and lines. To the naked eye all parts of the leaves appear quite smooth; but when examined by the microscope the general and partial petioles, the mid-ribs, and the edges of the leaflets, are seen to be covered with small, reddish, appressed, lymphatic hairs. The lamina of the leaflet is emarginate, but the summit of the mid-rib, crowned by a small bush of hairs, projects, on the dorsal surface, beyond the lamina, and gives the appearance of a minute pointlet or mucro. As the leaflets dry this pointlet appears to be shrinking and becoming brown. As the leaf grows it probably falls off.

[The three following pages of Dr. Pereira's memoir are occupied with a comparative examination of the leaves and fruit of the *Hoitziloxtl*, or *Indian balsam tree* of Hernandez; the *Myrospermum frutescens*, and *M. pedicellatum*, *M. peruiferum*,(Linn.) the *Myrospermum* described by Dr. Weddell, the *M. pubescens* of Kunth, *Myroxylon balsamiferum* of Pavon, and some others. As these descriptions are purely botanical, and as they are accompanied by a number of figures necessary to their full comprehension they are omitted and the scientific reader referred to the Pharmaceutical Journal, Vol. 10, pages 282 to 285, inclusive.—Editor.]

Central America is the country of the Myrospermum of Sonso-

nate. It grows on the Balsam Coast, (between 13° and 14° N. lat., and 89° and 90° W. long.,) in the State of Salvador, where the black and white balsam are exclusively obtained from it. Hernandez mentions Panuco as one the places where it grows; and Clavigero* states that it "is common in the provinces of Panuco and Chiapan."

Various medicinal products are obtained from this tree. "By making an incision in the trunk of it, a liquor exudes called the *black balsam*, an admirable remedy for effecting the speedy cure of wounds of every description: from the flowers the *spirit of balsam* is made: the seeds or nut produce the *oil of balsam*, an excellent anodyne; and the capsules yield the *white balsam*. From these simple kinds the *tincture* or *essence of balsam* is extracted; it is generally termed *balsamito*, and was a discovery of Don Jose Eustaquio de Leon, director of the mint in Guatemala who published a description of the many virtues of this peculiar medicine."†

The only medicinal products of the tree with which I am acquainted are *black balsam*, (commonly called balsam of Peru,) *white balsam* and *balsamito*.

1. *The Sonsonate or St. Salvador Black Balsam.*

This is the *Balsam of Peru*, (*Balsamum Peruvianum*, Ph. Lond.) of commerce. At Sonsonate it is termed *Black Balsam* (*Balsamo negro.*) It is sometimes denominated the *Black* or *liquid Balsam of Peru.*

Sonsonate or St. Salvador, black balsam of commerce (balsam Peru of the shops) is exclusively the produce of the Balsam Coast, which extends from the Acajutla to the Port Libertad, on the Pacific side of Central America.

It is obtained by the native Indians, who make incisions into the bark of the trees, burn the outside slightly, and insert woollen or cotton rags into the aperture to absorb the juice which exudes. When these are saturated they are removed and others introduced

*Storio Antica Del Messico, tomo i., p. 63. 1780. (Also the English translation by Cullen, vol i. p. 32. 1788.)

†*A Statistical and Commercial History of the Kingdom of Guatemala in Spanish America.* By Don Domingo Juarros. Translated by J. Baily, Lieut. R. M. Lond. 1823, p. 261.

in their place. The rags are then boiled in water in large jars, by which the balsam is detached, and, rising to the surface, is skimmed off and put into calabashes or bladders for sale. In this state the Indians bring it into Sonsonate. The merchants who purchase let it stand in barrels that the dirty water may separate, and afterwards strain it through a sieve to separate any pieces of rags, or other foreign bodies, which may be present. Usually a little pure water is added, and the balsam is put into jars for exportation at Acajutla. Sometimes it comes direct to Europe, at other times indirectly by Lima, Valparaiso or other parts of the Pacific, or by Belize or Honduras on the Atlantic side of Central America. The average production is about 25,000 lbs. per annum.

Mr. Wazsewiez tells me that the natives obtain this balsam from three species of *Myrospermum*, which he calls *M. punctatum*, *M. pubescens*, and *M. myrtifolium*, all of which he says grow on that coast, and are not distinguished by the natives.

2. *The Sonsonate or St. Salvador White Balsam.*

This substance is called, at Sonsonate, *White Balsam* (*Balsamo blanco.*) It is, I suspect, often confounded with the balsam of Tolu, for Mr. Klée, from Guatemala, by whom my sample was sent, says that he sends the white balsam as a sample of balsam of Tolu. Its properties, however, are entirely different to those of balsam of Tolu, which Ruiz calls white balsam.

White Balsam is obtained at Sonsonate by pressure, without heat, from the interior of the fruit and seed. Mr. Wazsewiez, who, when in Central America, had assisted in procuring white balsam, described and showed me the method of preparing the fruit for the expression of the balsam. It consists in removing the wings, the epicarp, and the fibrous or woody portion of the mesocarp. All these parts are readily separated by the fingers. The nucleus of the fruit, called at Sonsonate the *pepita* or seed, consisting of the internal portion of the mesocarp, the endocarp, and the seed, is then submitted to pressure.

The expressed product, which is called white balsam, probably consists of two distinct classes of substances, viz., the *oleo-resinous matter* contained in the pericarp, and the *fatty* and other constituents of the seed.

White balsam, as I received it, was imported in globular earthen jars, surrounded by a kind of wove or plaited matting, and closed by an earthenware stopper. The jar enclosed in the matting, is about a foot high (to the top of the stopper) and ten and a-half inches in diameter, and it contains about twenty pounds of balsam, which has partially concreted or crystallized on the sides of the jar.

Jar, enclosed by matting containing the white balsam.

When removed from the jar and put into a white glass bottle, it closely resembles in appearance strained American or Bordeaux turpentine. It is semifluid, or a soft solid; and by exposure becomes firmer. It is somewhat granular, apparently from intermixed resinous crystals. By standing, it partially separates into a white and more opaque crystalline resinous deposit, and a superior, more translucent, thinner, and more fluid portion. It is quite devoid of the fragrant cinnamic or vanilla odor of the balsams of Peru and Tolu. Its odor is not disagreeable, and is compounded of the peculiar smell of the balsamic matter of the pericarp, and of the melilot-like odor of the seed. One person who smelled it declared that it resembled the odor of cubebs.

It is only partially soluble in alcohol, but more so in ether. By digesting it in rectified spirit, three products are obtained: 1. A white, tough, soft solid, which remains at the bottom of the vessel. 2. An oleaginous yellow liquid which rests on the preceding; and 3, the spirituous solution which floats on No. 2. By digestion in ether, a portion of the balsam remains undissolved. The etherial tincture, by evaporation, yields a kind of fatty or resinous product.

Balsamito.

Esencia Tincturado del Balsamo Virgen; Essence or Tincture of Virgin Balsam.—This is a tincture of the fruit, and is made by digesting the fruit (deprived of its wings) in rum. The sample which Mr. Skinner kindly gave me, is a clear liquid, having the color of sherry wine, and the odor is like that of the melilot (*Melilotus officinalis*) or of the tonka-bean, and a very bitter taste. When mixed with water, it forms a milky liquid.

This preparation which is in high repute in Central America, was invented by Don Jose de Leon, Domiciliary Presbyter of the Archbishop of Mexico, and the director and founder of the Royal Mint of Guatemala. Its virtues (real or imaginary) are set forth at great length in a Spanish handbill (now before me) printed in Central America. An abstract of these is given in Lieut. Baily's translation of Juarros' *History of Guatemala*, before referred to. According to these authorities, balsamito is a stimulant, cordial, corroborant, anthelmintic, and diuretic. It is administered in the dose of a drachm in fainting fits, dyspepsia, flatulent colic, the cold stage of fever, hysteria, worms, &c. It is employed also to facilitate labor and the expulsion of the placenta, to check vomiting and diarrhœa, to relieve spasms, &c. In surgery it is extensively used as a vulnerary, as an application to sloughing sores, and to relieve the itching, heat, and pain which remain after the removal of a chigoe (*Pulez penetrans.*) Mixed with water it forms a milky fluid, which is used as a face-wash to remove freckles, and as a lotion for ulcers.

Mr. Skinner speaks in the highest terms of the beneficial results which he has himself witnessed from the application of *balsamito* to sloughing and other wounds, and he tells me it is in high repute in Central America as a vulnerary; a portion of this, which he kindly gave to me, I have placed in the hands of my friend and colleague, Mr. Luke, for trial in sloughing wounds. Mr. Luke tells me that he has applied it, in one case only, to a sloughing wound. It caused so much pain, that it became necessary to suspend its application. The slough, however, speedily separated.

I subjoin two extracts, one from a private letter to Mr. Skinner from his partner Mr. Klée—the other from Lieut. Baily's work on *Central America*, just published. They are in part my authorities for some of the preceding statements.

APPENDIX.

1. *Extract of a letter to G. U. Skinner, Esq., from Charles Rudolph Klée, Esq., Prussian Consul-General for Central America.*

"The tree which produces the *Balsamo negro* or *balsamo de Peru*, in this country grows only in a small district in the state of

San Salvador, near the town of Sonsonate, called "the Balsam Coast;" and although a very hot climate, it is a hilly country, but a very rich soil. It is only populated by pure Indians, who possess the secret of extracting the said balsamo de Peru, which they bring for sale to Sonsonate, put in gourds or bladders. In this way they used to ship it formerly, but the Indians bring it often mixed with rags and water; and now the merchants in Sonsonate let it stand some time in barrels and clean it, and then pack it in jars, in which package it is generally shipped now. Any other sort of oily matter does not mix with the balsam, and the dirty water gets soon to the bottom, after which it is strained; although it appears very thick it passes through a very thin sieve. Generally a little pure water is put into the jars; they say it prevents fermentation. From all the accounts that I could learn from the people in Sonsonate, and from the very Indians who sold the balsam, and which I believe to be true, it appears, that in certain seasons, they make incisions in the bark of the tree, burn the outside slightly, and then bind woollen or cotten rags round it, in which the balsam is caught up; the rags are afterwards boiled in large jars with water, and the rags fall to the ground. There is *no* other place on the whole Pacific side where this balsam is made, but on this Balsam Coast. All the balsamo negro which comes to the European markets, by way of Lima, Guayaquil, Valparaiso and Belize, Honduras, or Stó. Tomas de Guatemala, is the produce of our balsam coast. The whole production of it does not amount to more than 20,000 lbs. or 30,000 lbs. per year, the average may be 25,000 lbs. The merchants in Lima and Valparaiso buy it with much pleasure, and pay good prices to the Sonsonate merchants.

"The Canonigo Dhiguero, when he was proprietor of Ispanguasate, planted the balsam tree there, and I found about fifty fine large trees. The tree itself is a very fine, tall, and handsome one, with a straight, round, and high stem; the bark smooth, ashy-colored, and not very thick. The branches extend at the top, and the leaf is of a dark glossy green, rather a little curled. On a tree which was near the Campana, I tried the experiment to get the balsam out, but did not succeed; and one of the mozos told me that it was not the right time. The tree grows as high as any of your oak-trees, and as thick. In April, 1846, I purchased

two jars of *balsamo blanco* of a gentleman from Sonsonate, as a sample of *balsamo de Tolu;* these I send you as well as the kernels of which it is made. By the mode they manufacture it, it can never be made an article of trade; and unless you send us an apparatus and instruction how to extract it, which I think might be done in the way that heavy oils are extracted, such as oil of cloves, &c., provided it is worth while, no use can be made of it.

"The *Esencia tinturada del balsamo Virgen*, is what we call here *Balsamito*. Finding, by experience, that it would be a fine drug, curing old wounds, perfuming, washing, &c., &c., I got from Don Jose Soto the way to prepare it and the sample which I remit to you by the Honduras and Pacific side is pretty large, and of fine quality.*

"As I have told you already, this balsamito is made by infusing the nut of the balsam tree, macerating the shell and kernel in brandy† of thirty degrees. Its inventor was Jose de Leon, Esq., as you will see by the printed paper enclosed. However, the shell of the nut, which is like that of an almond, contains in its concavities a most aromatic oil, and more so than that of the kernel itself. Brandy can never extract all this oil. Perhaps Dr. Pereira would be kind enough to put you in the way to learn the mode how to extract the balsam, after he has seen the nut, &c."

2. *Extract from Mr. Baily's Work, entitled "Central America; describing each of the States of Guatemala, Honduras, Salvador, Nicaragua, and Costa Rica; their Natural Features, Products, Population, and reasonable capacity for Colonization."* 8vo, 1850 Saunders, 6, Charing Cross.

"That part of the coast extending from Acajutla to Libertad, is emphatically termed the "Balsam Coast," because there only is collected the article known in commerce as the Balsam of Peru; the particular district is intermediate to the two ports, and is not large, as it does not reach either of them within three or four leagues. Lying to the seaward of a low lateral ridge of mountains,

*It is now in the West India Docks.—J. P.

†The liquid here and in other places called "brandy," is in fact "rum," being obtained by fermentation from sugar.—J. P.

the whole tract, excepting a few parts on the borders of the ocean, is so much broken up by spurs and branches thrown off from the main eminence, and so thickly covered by forest as to be nearly impassable to a traveller on horseback; from this cause, it is so rarely visited, that very few residents, either of Sonsonate or Salvador, have ever entered it. Within this space are situated some five or six villages, inhabited solely by Indians, who are so jealous of their possessions, that they will not suffer any of a different race to live among them. They cultivate so little ground for maize, frixoles, plantains, and other necessaries for subsistence, besides a very small quantity of cocoa, that they are not unfrequently forced to purchase these articles from adjoining parts. They have their own municipalities and chief men, governing themselves pretty much as they please, being, in fact, almost independent of every other authority. In some of the villages there is a church, but in no one a resident curate, who, when his ministry is deemed indispensable on festivals or other occasions, is attentively conveyed by them to and from Guayacoma or Ateas, to which curacies they nominally are dependant. Strictly speaking, they hold no other intercourse with other towns than what is necessary for carrying on their peculiar traffic.

"They support themselves by the produce of the balsam trees and cutting cedar timber, of which they furnish large quantities in plank and scantling to Sonsonate and San Salvador for building purposes and carpentering, with occasionally some pieces of more valuable wood, fit for cabinet work. Their chief wealth is the balsam, of which they take to market from fifteen to twenty thousand lbs. weight annually, yielding from four thousand seven hundred, to six thousand three hundred dollars. It is sold in small portions at a time in the before-mentioned towns to persons who purchase for exportation. The trees yielding this commodity are very numerous on this privileged spot, and apparently limited to it, for on other parts of the coasts, apparently identical in soil and climate, rarely an individual of the same species is here and there met with.

"The balsam is extracted by making an incision in the tree, whence it gradually exudes, and is absorbed by pieces of cotton rags, inserted for the purpose. These, when thoroughly saturated,

are replaced by others, which, as they are removed, are thrown into boiling water. The heat detaches it from the cotton, and the valuable liquor being of less gravity than the water, floats on the top, is skimmed off, and put in calabashes for sale. The wood of the tree is of close grain, handsomely veined, nearly of a mahogany color, but redder; it retains for a long time an agreeable fragrant odor, and takes a fine polish. It would be excellent for cabinet makers, but is seldom to be obtained, as the trees are never felled, until by age or accidental decay all their precious sap is exhausted. This balsam was long erroneously supposed to be a production of Southern America, for, in the early period of Spanish dominion, and by the commercial regulations then existing relative to the fruits of this coast, it was usually sent by the merchants here to Callao, and being then transmitted to Spain, it there received the name of Balsam of Peru, being deemed indigenous to that region. The real place of its origin was known only to a few mercantile men."—(Pp. 93, 94.)

ON MYROXOCARPINE—A NEW CRYSTALLINE SUSBTANCE FROM WHITE BALSAM.

By John Stenhouse, LL. D., F. R. S.

A few months ago I received a quantity of fragrant semifluid balsam from my friend Dr. Pereira, which had been sent to him from Guatemala, under the name of *white balsam*.

This balsam is said to be obtained from the fruits of the same tree which yields the ordinary balsam of Peru.

The white balsam is quite neutral to test paper, and has a peculiar agreeable smell, pretty closely resembling that of melilot. On digesting the balsam in spirit of wine of ordinary strength, a considerable portion of it readily dissolved, and on the clear liquid remaining at rest for twelve hours, a quantity of large white crystals were gradually deposited. These crystals, which retained a good deal of adhering resinous matter, were obtained perfectly pure when they had been digested with a little animal charcoal, and repeatedly crystallized out of hot spirits. When pure the

crystals have no smell, and form broad thin prisms rather more than an inch in length. They are colorless, and possess considerable lustre, approaching that of nitrate of silver. They are hard and brittle; insoluble in both hot and cold water, but readily dissolve in hot alcohol and ether. They are also soluble to some extent in cold alcohol and ether. When chewed they have no taste. Their solution is quite neutral to test paper. I have given this crystalline substance the name of *myroxocarpine*, in the belief that it is derived from the fruits of the Myrospermum as previously mentioned. It was subjected to analysis with oxide of copper in the usual way.

I. 0.2907 substance dried *in vacuo* gave 0.821 carbonic acid and 0.247 H O.

II. 0.215 substance gave 0.6085 carbonic acid and 0.185 water.

Calculated in numbers:			I.	II.
48 C	3600	77.63	77.02	77.18
35 H	437.5	8.43	9.46	9.55
6 O	600.0	12.94	13.42	13.27
	4637.5	100.00	100.00	100.00

The empirical formula for myroxocarpine is therefore

48 C 35 H 6 O.

Myroxocarpine, when dried *in vacuo*, and then heated to 100° C., loses no weight. It melts at 115° C., and forms a transparent glass, which does not crystallize on cooling. It re-crystallizes, however, when it has been dissolved in hot spirits of wine. When myroxocarpine is heated considerably above its melting point, a very small portion of it sublimes, but by far the greater part of it undergoes decomposition, being changed into an un crystallizable resin, with the formation of much acetic acid.

Myroxocarpine is characterized by extreme chemical indifference. It displays no affinity for either acids or alkalies, none of which at all increase its solubility. A quantity of it remained unchanged after been having boiled for several hours with a solution of potash. It is also but difficultly attacked by acids. Strong nitric acid, when assisted by heat, slowly converted it into oxalic acid, and an uncrystallizable resin, but without the formation of carbazotic, or any similar acid. Chlorine also acts upon it very slowly.

A current of chlorine gas sent for several days through a quantity of myroxocarpine in a finely divided state, and diffused through water, slowly converted it into an uncrystallizable resin, which contained variable quantities of chlorine. The chlorine, however, was retained by a very feeble affinity, for when the resin, which had been washed with water till it was quite natural, was dissolved in hot spirits, its solution, on standing for a short time, became strongly acid. Bromine produced a very similar result.

I regard myroxocarpine, therefore, as a very indifferent crystallizable resin which, in some respects, especially in the readiness with which it crystallizes, closely resembles santonine, but exhibiting much feebler chemical affinities than even that compound. The white balsam is very rich in myroxocarpine, a pound of the balsam yielding about one ounce of the principle.—*Pharmceutical Journal, Dec.* 1, 1850.

ON THE MANUFACTURE OF COMMERCIAL ACETATE OF SODA.

By Jacob Bell, Editor of the London Pharmaceutical Journal

Manufacture of the Acetate of Soda.—The cold concentrated solution of acetate of lime* (which it is desirable should be made with distilled acid) is to be treated with a concentrated *filtered* solution of sulphate of soda, specific gravity about 1.250 temperature 98°, and agitated well by machinery, if convenient, during the precipitation of the sulphate of lime, till a little of the liquor from the decomposing vessel in which this operation is conducted will not show any precipitate on the addition of a solution of sulphate of soda in a test-tube. When this takes place, the contents of the decomposing vessel must be run on to a back, and then filtered into a cistern. Two of these backs will be required if the manufacture is conducted on a large scale, each furnished with a cistern, as it will require a good deal of washing to get all the acetate of soda from the sulphate of lime; they are to be furnished with false bottoms, and filters of stout twilled flannel. It is immaterial whether they are made square or round; the former

* See page 51 of this volume.

is most convenient where it is desirable to economise room; each ought to communicate with *both* cisterns, so that when one back has ceased to pour strong liquor into one cistern the pipe may be stopped with a plug, and that communicating with the other cistern opened for receiving the washings of the backs. It may be ascertained when the precipitate is sufficiently washed by the taste of the liquor running away from it into the weak liquor cistern, when it is tasteless or nearly so, the sulphate of lime must be dug off with a wooden spade or shovel (iron is apt to cut the flannel), the back is then ready for another batch from the decomposing vessel. The liquor is now to be pumped from the cisterns into the iron pans, which ought to be so cast that they may offer as much heated surface as possible, and yet be not too large for a man to keep their contents in a state of brisk agitation with an iron stirrer broad and flat at the end. As it approaches dryness the temperature should not much exceed 500°, otherwise the acetate will be decomposed and converted into carbonate. Great nicety is required in this part of the manipulation, which depends entirely on the skill of the workman. When the mass is in quiet fusion, and there is no frothing up, the process is usually finished. Having thus dissipated the tar, the dry acetate may either be at once converted into acetic acid, or dissolved and crystallized; it is more soluble in the latter condition. It is most conveniently dissolved in a large cylindrical lead vessel, heated by shooting steam into it. When the solution is completed, it may be run through a flannel filter into the top of a course of steamers, furnished with coils of three-quarter inch lead pipe. These vessels are made of four pound sheet lead cased in boards. The best size is about twenty-four feet long, four feet wide, and about nine inches deep. The pipe should be coiled from one end to the other, and go up and down about three times. Too much pipe cannot be used, as the rapidity of the evaporation depends upon the quantity employed. As the evaporation proceeds, the liquor ought to be syphoned from the top to the second, and afterwards to the third steamer, and thus make room for more bulky weakly liquor; from the dissolving lead when a pellicle appears on its surface, it should be syphoned off into leads, and left for a couple or three days (according to the season) to crystallize. These leads need not be of heavier metal than four pounds, and made four feet long, two feet wide, and nine inches deep, but their form

must depend entirely upon the size of the crystals required. Should they be wanted larger than can be obtained in the above, the leads must be deeper, packed in sawdust, and allowed to stand a longer time. When the crystallization is complete, the mother-liquor must be taken from the crystals and emptied into the dissolving lead, and with the addition of two or three times its weight of water, used in dissolving fresh fused salt from the torrifying pans; the crystal must then be cut out of the leads, and thrown into a conical-shaped drainer and well washed. The liquor caught from the drainer must be put into the dissolving lead also. The crystals are now to be removed from the drainer to the drying-stove, where, after having been a few hours on the shelves, they should be packed in casks, and the sooner they are sold or used the better, as by keeping a loss of weight is sustained by deliquescence. The following process has been employed in the Cornbrook Works, near Manchester, under the able superintendence of Mr. A. P. Halliday :—

The rectified pyrolignous acid is saturated with lime, and the resulting solution of acetate of lime boiled down to specific gravity 1.200. This solution is now dosed with sulphate of soda, obtained from the decomposition of acetate of soda by sulphuric acid, until their is no further precipitate; sulphate of lime then falls down, and acetate of soda remains in solution. The sulphate of lime is thrown upon stone filters, twelve ft. by six ft. and washed with water until the solution comes off so weak as not to be sufficient to afford remuneration for the expense of labor, time, and fuel. The solution of acetate of soda along with the washings of the sulphate of lime, is next boiled down in iron pots, six ft. long, by three ft. deep, cold set, until its specific gravity reaches 1.300. During the evaporation, the excess of sulphate of soda is fished up in ladles, pierced full of holes, and the salt laid on drainers suspended over the pot from which it had been raised. The solution at 1.300 specific gravity, is allowed to settle over night and then drawn off to crystallize. The crystals are dissolved, in dilute pyrolignous acid, and the solution at 1.270 drawn off after settling for a fresh crystallization; the crystals are again dissolved, drawn off at specific gravity 1.500, dried and fused. The solution of fused salt is evaporated down, crystallized, and the crystals again dried and fused, and the fused salt allowed to flow out on an iron

plate, where it becomes solid, and is afterwards broken up and dissolved in water. This solution when dosed with sulphuric acid, yields pure acetic acid. Sometimes the sulphate of soda is dissolved in the crude acid, and the chalk or lime subsequently added, a portion of fuel required for evaporation is thus saved. The most economical plan, however, is that of saturating the acid liquor with sulphuret of sodium, as recommended by Turner, the only objection to its employment arising from the sulphuretted hydrogen evolved in the process, which has been known to affect individuals living upwards of two miles from the works where the process was in use. The double decomposition process above described, is by no means a satisfactory one. The sulphate of lime resulting from the decomposition carries some of the salt away with it by direct combination; it also robs us indirectly, inasmuch as we cannot wash it so as to take away all the acetate of soda, on account of the fuel required to evaporate the water used. In decomposing the acetate of lime by sulphate of soda, there is more delicacy required than workmen find convenient; the consequence is that there generally exists in the acetate of soda solution, either acetate of lime or sulphate of soda; the latter is removed by boiling out, but the former runs the crystals, as the workmen call it, that is, prevents crystallization. This happens not unfrequently. Not more than one ton of acetate of soda is usually obtained from a ton of acetate of lime, and oftentimes a much less quantity.

In some manufactories of acetate of soda, the salt is not made to undergo igneous fusion; but it is purified from all extraneous matters by repeated crystallizations and filtrations through animal charcoal, previously well washed with dilute hydrochloric acid. Care should be taken that the solution of the fused salt has not a greater specific gravity than 1.116, otherwise the carbonaceous matter with which it is mixed will not settle; the solution should then be allowed to settle for twelve hours, the clear liquor poured off, evaporated to 1.250, and put to crystallize.

Mitscherlich recommends that the solution of acetate of lime employed should be of specific gravity 1.116; and that the solution of acetate of soda be evaporated to 1.230, or 1.240, and then put aside to crystallize. Another process is that of neutralizing the acid liquor with soda-ash; this is no doubt the most convenient process, but not the most economical.—*Pharmaceutical Journal, October* 1, 1850.

MITCHAM: ITS PHYSIC GARDENERS AND MEDICINAL PLANTS.

V. HENBANE.

In the notices of the Mitcham physic gardens, by Lysons, Malcolm, and others, no mention is made of henbane. We may, therefore, infer that its cultivation at Mitcham is comparatively modern.

Two varieties of henbane (*Hyoscyamus niger*, Linn.) are cultivated by the herb-growers at Mitcham, the biennial and the annual.

Var. *a, biennis*. Biennial black henbane.—The plants of this variety are stronger, more fully developed and branched, more clammy, and possessing in a higher degree the downy character and peculiar odor of the plant. The leaves are deeply incised, and the flowers reticulated with deep purple veins. During the first year of its growth, the plant has no aerial stem, all the leaves being radical and stalked. In the autumn these leaves die, but the root survives the winter, and in the following spring sends up an aerial stem, which grows to the height of two, three, or four feet. The plant flowers towards the end of May, or in June.

Var. *b annua*. Annual black henbane.—This was at one time considered to be a distinct species, and was called *Hyoscyamus agrestris*. It is now admitted to be a variety only. The root is annual, the stem smaller, less branching, and less downy, the leaves less deeply incised or sinuated, less hairy and clammy. It flowers in July or August. Altogether it may be considered as a weaker and shorter-lived variety. Not unfrequently its carolla is devoid of the purple veins. This peculiarity was at one time thought to indicate a distinct species, which was named *Hyoscyamus pallidus*.

Miller mentions in his *Gardener's Dictionary*, that a variety of *H. niger* was found by Professor John Martyn, near the castle at Cambridge, about the year 1729, with the corolla and anthers of a pure brimstone color, without the least tinge of purple. The seeds being sown in the botanic garden at Chelsea, produced that very same variety. But he does not say whether this was an annual or biennial sort.

Mr. Babington states that this non-reticulated sub-variety grows

wild at Esher in Surrey. On inquiring of Mr. Authur, of Mitcham, we found that this non-reticulated sub-variety was well known to him, though it is not distinguished as a different sort by the herb-growers.

No positive evidence has hitherto been adduced of the superiority of the biennial over the annual sort; but the prevailing belief is, that the more fully developed, and longer lived plant, in all probability, would more perfectly elaborate its peculiar juices, than the weaker and shorter lived sort, and on this ground, it is presumed to possess greater activity. Although the present Pharmacopœia (1836) leaves the Pharmaceutist to use either sort, the forthcoming new London Pharmacopœia, it is reported, will direct the employment of the biennial variety.

The biennial plant ought to be gathered for medicinal use during the second year of its growth, at or soon after the commencement of inflorescence. The leaves at this stage are attached to the stem which bears the flowers, and when the plant is entire, no mistake can be made, as the leaves of the first year have stalks which issue from the ground, as described by Dr. Houlton, and figured in the Pharmaceutical Journal, vol. i., p. 406 and 427. Mr. Squire has also pointed out the importance of distinguishing between the first and second year's leaves. When the stalk is removed the distinction is less easy, and the herb, as sold in the market, not unfrequently contains a mixture of the two kinds.

Although the above are the general distinctive characters, they occasionally merge into each other in individual plants, so that it is not always easy to distinguish the varieties or age, especially when the plants have been packed for travelling, and when they have been partially or entirely dried. Consequently the purpose for which the first year's leaves are chiefly used is for preparation in a dried state, in which they might, on a superficial examination, pass for the second years' leaves. Sometimes, however, so little care is taken to disguise the fact, that the long stalks betray the age of the leaves. There is a strong temptation to use the leaves in this stage of their growth, first because they yield a return which would otherwise be sacrificed; and secondly, because in brightness of color they surpass the mature leaves, and, therefore, attract those whose primary object is to please the eye. But the instructions contained in the Pharmacopœia to select the plant at the time of inflorescence, are

founded on correct principles. Mr. Moore, of Mitcham, informs us, that he never sells the first year's leaves, considering them worthless.

The annual and the biennial varieties are cultivated at Mitcham in distinct plantations. Formerly the biennial was chiefly met with and it was at one time a disputed point whether henbane was ever matured during the first year. Since this point has been decided, the annual plant has come into cultivation, and it has gradually superseded the biennial to a certain extent, as it is found more profitable to realise the return in the shorter period. The seeds are sown early in the spring; as soon as the weather is favorable, the annual plants are thinned, if necessary, and the crop is gathered about July or August.

The biennial plants are transplanted in the spring of the second year, and the gathering of the crop commences sometimes as early as May, and generally continues throughout June, and the early part of July.

It is usual to change the ground every two or three years; but this appears to be optional, as the plant grows wild in many places for ten or twenty years in succession, and some of the finest biennial plants are met with in the wild state. Mr. Bridger (at Mr. Moore's, Mitcham) informs us that he has seen specimens of these plants weighing as much as fourteen pounds, while the annual variety seldom exceeds three or four pounds, and the average much less.

The following report shows the variation in the product of extract arising from various circumstances. The notes were taken merely for private use, but they are quoted from the original memoranda, including the cases of failure in the result. With two exceptions the plant was furnished by the herbalist or grower, as the biennial variety in the second year of its growth. The leaves were separated from the stem, sprinkled with water and crushed, the stem being rejected.

June 13, 1844—Henbane, 3cwt. 21lbs., produce 14lbs. 9ozs.

The herb was crushed in a mill, and brought to the premises in a state of pulp. This plan was found not to answer: the delay occasioned by its transference through the different stages of the process impaired the quality, and although the produce was large it was unfit for use.

The plan of crushing the herb in a mill, although the most effectual in regard to the quantity of extract produced is liable to this disadvantage, that when the herb is too much crushed the inert fibres, are reduced to a pulp, and may in part pass through the cloth with the juice. In the following cases the plant was bruised in a marble or stone mortar with a wooden pestle:

	cwt.	lb.		lb.	oz.	per cwt.
1845 June 19,	1	0	produce	2	10	2 10
" July 12,	1	0	"	3	13	3 13
" " 16,	1	0	"	3	10	3 10
" " 23,	1	56	"	4	12	3 1¾
1846 May 29,	2	0	"	4	10½	2 5¼
" June 8,	1	39	"	4	14	3 2
" " 13,	1	0	"	2	10	2 10
" " 17,	1	0	"	2	8	2 8
" " 30,	1	5	"	2	15	2 14
" July 1,	1	7 (annual)	"	3	4	3 3½
1847 June 14,	1	40	"	3	12	2 2
" " 22,	3	0	"	6	12	2 4
" " 23,	1	56	"	4	9	3 0
" " 24,	2	0	"	3	14	1 15
1847 July 10,	2	0 (old and bad)	product not fit for use			
1848 June 2,	2	0	"	5	1	2 8¼
" " 3,	2	0	"	5	8	2 12
" " 6,	2	0	"	6	12	3 6
" " 7,	2	0 (old)	"	4	14	2 7
1849 June 6,	2	56	"	5	12	2 4
" " 11,	2	0	"	5	0	2 8
" " 26,	2	0	"	6	0	3 0
" Aug. 6,	2	0 (annual plant, leaves only)	"	10	12	5 6
1850 June 21,	1	56	"	4	8	3 0
" " 25,	1	56	"	3	14	2 15¼

Pharm. Journal, Nov. 1, 1850.

ON THE DISTILLATION OF MERCURY BY HIGH PRESSURE STEAM.

By M. Violette.

This new process for the distillation of mercury, consists in immersing the mass to be distilled in the current of the vapour of water heated from 350° to 400° centigrade: the vapor acts at once as the heating agent and mechanical agent; it first heats the metal so as to produce distillation, and then drives before it and draws the mercurial vapor, the reproduction of which it facilitates; it hastens the distillation, just as a hot current of air increases the evaporation

of water; the aqueous vapors, charged with mercurial vapor, are condensed together in a common refrigeratory, the metal separates at the bottom of the receiver, while the condensed water occupies the upper part. It is curious to observe the liquid thread which flows from the refrigeratory; two currents or threads are distinguishable, an upper one which is water, and below is the mercurial thread; there is a continuous current of both. No concussions occur, and the operation goes on as quietly and as easily as the distillation of water.

The apparatus employed by the author in these experiments consists of,—1st, a cast iron cylindrical retort, receiving the vessel which contains the mercury; 2ndly, an iron worm, which, being heated, the vapor of water circulates in it, and being heated to a proper degree, enters the retort, traverses it from one end to to the other, the mercury being immersed in it; it then escapes with the mercurial vapor, and both are condensed in a refrigera, tory.

The author gives in a series of tables the results which he has obtained by a series of experiments relating to the distillation of mercury, both alone and amalgamated; he states the quantity of vapor necessary, and the economical advantages of the new process which he thus details:—

1. *Facility of the operation.*—Simple ebullition and the distillation of water are substituted for the difficult and dangerous distillation of mercury; in which there is more trouble in managing the fire, more danger of breakage of the apparatus, more difficulty in removing the metal, more wear in the retort; whereas, in the new process, the temperature is constant and fixed, and much lower than the red heat usually employed.

2. *Economy of operation.*—One workman alone can manage an apparatus charged with 1000 kilogrammes of amalgam; the new process is adapted to even larger dimensions.

3. *Economy of Fuel* is certain, and practice alone can state the amount of it; no useless expenditure of fuel will occur, since the heat employed will not be greater than required for the distillation of the metal.

4. *Economy of Mercury.*—The distillation of 100 kilogrammes of silver amalgam occasions the loss of two kilogrammes of mercury. There are produced and annually distilled six millions of amalga-

mated silver; there is therefore a loss of 120,000 kilogrammes of mercury, worth at least one million of francs, which loss the new process avoids.

5. *Public Health.*—In the new process there is no loss of mercury; the mercurial vapor is condensed with the vapor of water; further, in the common operation, mercurial vapor fills the whole of the apparatus, and when it is opened at the close of the operation, the vapor is diffused in the atmosphere; whereas in the new process the vapor has driven all metallic vapor from the apparatus, and there is no danger in opening it. Thus our operation is complete, and the employment of high pressure steam seems to have effected the long sought solution of the problem, of perfectly preserving the workmen fom the mortal attacks of mercury in the numerous and important uses in which this metal is distilled.—*Chem. Gaz.* Dec.16, 1851, from *Comptes Rendus.*

ON THE PURIFICATION OF SULPHATE OF IRON OF COMMERCE TO FIT IT FOR MEDICINAL PURPOSES.

By M. Thorel, (D'Avallon).

M. Thorel, in the *Journal de Pharmacie* for Nov., 1850, points out a mode of treating commercial sulphate of iron (copperas), so as to free it from its most usual impurities as occurring in France. He states that bi-tartate of potassa, boiled with an impure solution of proto-sulphate of iron, will precipitate the zinc as an insoluble tartrate of potassa, zinc, and iron. He further ascertained that neutral tartrate of potassa precipitates manganese from the sulphate as an insoluble tartrate. The copper is separated by boiling the solution with iron filings and a little sulphuric acid, which also brings the sulphate completely to the state of a proto-salt. The following is his formula.

Take of Copperas,	3000	parts.
Iron-filings,	90	"
Sulphuric acid,	20	"
Water,	8000	"

Put the whole in a cast iron boiler and heat to ebullition, stirring continually. Half an hour's boiling is sufficient to decompose

the sulphate of copper; the best means of being certain of which, is to hold a bright spatula in the boiling solution a few minutes, when if any copper remains the spatula will be covered with a film. The solution is now decanted from the excess of iron-filings and evaporated to 33° Baumé. Whilst yet boiling, *six* parts of *bitartrate of potassa* in powder are added, and after a few minutes the vessel is removed from the fire, and the solution slightly acidulated with sulphuric acid. The solution is filtered into bottles, and then poured into plates, previously rinsed with a little diluted sulphuric acid, that it may crystallize. In three or four days the solution is decanted from the crystals, which are drained and dried spontaneously.

ON THE THERAPEUTICAL APPLICATION, AND ON THE PREPARATION OF HYDRIODIC ETHER.

In the Journal de Pharmacie for October, 1850, an account is given of the employment of hydriodic ether as a remedy, by way of inhalation by Dr. Huette. Fifteen to thirty grains of the hydriodic ether is transferred, by means of a graduated pipette, into a little ground stoppered bottle, (3 or 4 centimetres) an inch to an inch and a half high. The ether is covered with a stratum of water about 2 or 2½ millimetres thick, the object of which is to moderate the evaporation; when the vial is applied to one of the nostrils, and the air contained within it is drawn by an inspiration. The ethereal vapor is sufficiently diluted with air before reaching the lungs. The evaporation of the ether may be accelerated by inclining the vial to one side, so that the continuity of the watery layer may be broken; and the heat of the hand may be applied to the same object. Fifteen or twenty inspirations suffice for the impregnation of the system with iodine, and a quarter of an hour after the cessation of the inhalations, iodine is found in the urine. Nevertheless Dr. Huette has ascertained it to be present fifty or sixty hours afterwards.

Dr. Huette thus describes the physiological effects of this ether. "After some inhalations," says he, "an impression of calmness and

satisfaction announces that the hydriodic ether acts at first conformably with the sedative properties of the other ethers employed in medicine. The respiratory motions are carried on with a readiness and fulness, advantageous to the circulation; but the anti-spasmodic action of the ethereal vapor which favors the absorption of the remedy, is soon followed by the influence of the absorbed iodine. The increase of vigor ceasing to be limited to the thoracic muscles, extends to the muscular system. The appetite is developed, the secretions are increased, the genital feelings become more sensitive, the pulse acquires fulness, and the vivacity of the feelings, and the activity of the intellect, proves that the impulse given to the other organs extends to the brain also. Such are the effects that four daily inhalations of ten minutes each have produced on us. As to accident, we have never experienced any thing but a little coryza, and frequently when the vapor has been too concentrated, a slight feeling of pressure in the temples."

M. Huette thinks there will, in many cases, be an advantage in substituting the inhalation of hydriodic ether, for the other preparations of iodine, observing that inhalation permits the fractioning of the doses to any extent, and causes the absorption of the medicine by more extended surfaces, more generally accessible in all their parts, and better calculated for the absorption of the smallest medicinal atoms, than are the digestive organs.

M. Cap in the *Journal de Pharmacie* for November, 1850, gives a note relative to the preparation of hydriodic ether.

Hydriodic ether was discovered about twenty-five years since by M. Gay-Lussac. It is formed from a mixture of one part of hydriodic acid and two parts of alcohol.

To prepare it, mix four parts of iodine with ten parts of alcohol 38°. Add little by little one part of phosphorus, and submit the whole to distillation. When the large part of the alcohol has distilled over, add three parts more, and distil to dryness. The product of the distillation is mixed with water to separate the alcohol from the ether, which last is then rectified from chloride of calcium.

Hydriodic ether has no acid reaction. Its odor is ethereal, its taste pungent, but less sharp than that of sulphuric ether. Its density is 1,9206 at 72° Fahr.; it boils at 110° Fahr. and it is not in-

flammable. When thrown on burning coals, it expands in purple vapors. It is not decomposed immediately by potassa, nor by nitric or sulphurous acids, but sulphuric acid decomposes it, and sets at liberty a part of the iodine.

The action of the air discolors it slightly by liberating a little iodine, which may be readily removed by the alkalies and mercury, a globule of which thrown into the vial, is sufficient to retain the ether in a state proper for inhalation. Its density admits of its being kept under water, in which it is insoluble; a circumstance favorable to the mode of using it suggested by Dr. Huette.

ON CITRATE OF CAFFEIN AND ITS EMPLOYMENT AS A REMEDY FOR THE IDIOPATHIC HEADACHE, CALLED MIGRAINE.

By M. Hannon.

Citrate of Caffein may be obtained by two processes, the most simple consists in infusing raw coffee, ground to powder, at the temperature of 176° Fahr. in a very weak solution of citric acid, filtering the liquid whilst yet hot, adding two thirds of its volume of ether, and agitating the mixture strongly to remove the chlorogenic acid from the watery solution. The latter is separated from the supernatant ether, and is carefully evaporated with a gentle heat. The Citrate of Caffein crystallizes in long needles, which when redissolved in distilled water and again evaporated, are obtained in beautiful long acicular white silky crystals in radiating groups.

The second process consists in making the compound by the direct union of its constituents, the caffein being dissolved in a weak solution of citric acid at the temperature of 112° Fahr. and the solution gently evaporated till the citrate crystallizes.

This salt is very soluble in water, and is assimilated much more readily than pure caffein when taken into the stomach. It consists of one equivalent of caffein, three equivalents of citric acid, and two equivalents of water.

Pills of Citrate of Caffein.

Take of Citrate of Caffein,	8	grains.
Chiendent, (Triticum repens)	15	"

Mix, and divide into ten pills.

Use—One pill to be given every two hours at the commencement of an attack of migraine, (or pain in the forehead,) or every hour when the suffering is acute.

Syrup of Citrate of Caffein.

Take of Citrate of Caffein,	2½	drachms.
Simple Syrup,	4	ounces.

Dissolve the salt in the syrup.

This syrup is given in tablespoonful doses every hour or two hours, according to the violence of the attack.

M. Hannon gives receipts for lozenges, ointment and clysters of citrate of caffein.—*Jour. de Pharm. Aout.* 1850.

ON THE PREPARATION OF ATROPINE.

By M. Rebourdain.

In a memoir published by MM. Bouchardat and Stuart Cooper in the "Annuaire de Therapeutique" for 1849, these chemists describe a process for the preparation of atropine, which yields it in a very pure state, but in extremely small quantity. They observe, that the preparation of atropine cannot be so easy as stated by the authors who have made us acquainted with this vegetable alkaloid, since we know several chemists in France who have tried to prepare it without success; that which is met with in commerce is derived from Germany.

The following process, which enables us to obtain it in a simple, quick and easy manner, may therefore prove of some service. Fresh belladona, collected when just about to flower, after having been well pounded in a marble mortar, is submitted to pressure to extract the juice: this is then heated to 176°-194° F. in order to coagulate the albumen, and filtered. When the juice thus clarified is cold, 4 grammes of caustic potash and 30 grammes of chloroform to the quart are added to it: the whole is then agitated for a minute, and set aside. In the course of half an hour, the chloroform charged with the atropine, and having the appearance of a greenish oil, has subsided; the supernatant liquid is decanted and replaced by a little water; this is then decanted, and the washing continued until the decanted water is perfectly clear. The chloroform solution is then poured

into a small tubulated retort, and the distillation carried on in a water-bath until all the chloroform has passed into the receiver. The residue in the retort is digested with a little water acidulated with sulphuric acid, which dissolves the atropine, leaving a green resinous matter; the filtered solution is colorless. In order to obtain the atropine in a state of purity, it is merely necessary to pour the solution into a slight excess of carbonate of potash, to collect the precipitate, and to dissolve it in rectified alcohol. This solution furnishes, on spontaneous evaporation, beautiful groups of acicular crystals of atropine.

When it is impossible to obtain the fresh herb, the carefully prepared officinal extract may be used. 30 grms. of extract of belladonna, made with the purified juice of this plant, were dissolved in 100 grms. of distilled water; 2 grms. of caustic potash and 15 grms. of chloroform were added to the filtered solution. After having agitated the mixture for a minute, and then left it to settle for half an hour, the chloroform holding the atropine had subsided; it was washed with water three times after the supernatant liquid had been decanted; the chloroform solution, collected upon a watch-glass weighed 11 grms. This solution, exposed to the air, soon evaporated leaving a greenish crystalline mass, consisting almost entirely of atropine; digested with acidulated water, this mass, on being mixed with a solution of carbonate of potash, furnished a precipitate which weighed 15 centigrms. It was entirely soluble in rectified alcohol, and furnished, on spontaneous evaporation, beautiful crystals of atropine.

I believe this method may be applied to several other substances containing organic alkaloids; if not an economical method of obtaining these products, it may at least serve in many cases for determining quickly the value of certain commercial products.

In an early communication I shall describe a method for quickly ascertaining the commercial value of the Cinchonas, by acting upon a very small quantity of bark; I shall also show, that, by means of chloroform, the least traces of iodine can be detected, and shall point out the advantages which it possesses over that by starch.—*Chem. Gazette*, Dec. 2, 1850, from *Comptes Rendus*.

ON THE ESTIMATION OF IODINE IN ORGANIC SUBSTANCES BY MEANS OF CHLOROFORM.

By M. Rabourdain.

The detection of iodine by means of starch paste leaves nothing to be desired as regards sensitiveness; but this is no longer the case when the quantity of iodine in organic substances has to be determined. Chloroform may be advantageously placed by the side of starch as a test for traces of iodine, for by means of this reagent its presence may be detected in a liquid containing less than one hundred thousandth of its weight. If we take 10 grms. of a liquid containing one hundred thousandth of its weight of iodide of potassium, add to this liquid 2 drops of nitric acid, 15 to 20 drops of sulphuric acid and 1 grm. of chloroform, the latter after agitation acquires a very distinct violet tint.

I have endeavored to turn to account this remarkable property which chloroform possesses of removing from water the iodine which it is capable of holding in solution in the free state, and of acquiring a violet color, in order to estimate approximatively the iodine in organic substances, and especially in cod-liver oil, so largely employed in medicine at the present day.

I take 50 grms. of cod liver oil, which I mix by agitation in a phial with 5 grms. of caustic potash dissolved in 15 grms. of distilled water, and heat this mixture in a large iron spoon in order to destroy the whole of the organic matter; the cinder is exhausted with distilled water, to remove the soluble portion; as little water as possible should be employed; the liquid is filtered; 10 drops of nitric acid and of concentrated sulphuric acid are added, taking care to cool the mixture; 4 grms. of chloroform are then poured into it, and the whole well shaken. After a time the chloroform is deposited, colored violet; the supernatant liquid may be decanted, and the chloroform solution be washed with water without depriving it of its color.

On the other hand, a normal liquor is prepared containing 1 centigrm. of iodide of potassium in 100 grms. of distilled water, so that 10 grms. represent, 1 milligrm. of iodine. We now take 10 grms. of this solution, 29 drops of sulphuric acid and 4 grms. of chloroform; by agitation, a colouring is obtained, which is compared with the tint furnished by the cod liver oil; in general it is necessary to add

1, 2 or 3 grms. of the normal solution, in order for the tint to be the same depth.

I have examined the three principal kinds of cod-liver oil which are found in commerce :—

1. Dark mahogany color, called brown in commerce.
2. Amber-colored, called blonde in commerce.
3. Colorless, called white or English in commerce.

Each kind was examined three times, operating, as above stated, upon 50 grms. To obtain a tint of the same depth as that furnished by 50 grms. of the brown oil, I employed 14 grms. of the normal solution, or 0.0014 of iodide of potassium, and only 12 grms. of the same solution for the two other kinds of oil. These three oils contain therefore very nearly the same proportion of iodine, which would be 1 milligrm. for 50 grms., [1-70th of a grain in 1½ ounces] admitting that no loss occurs in the incineration.

I have likewise ascertained by experiment, that chloroform removes completely any free iodine from an aqueous solution. I saturated 500 grms of water with pure iodine; after having filtered the solution, I agitated it three different times with 15 grms. of chloroform; the third time the chloroform was in every instance scarcely colored.

A very small quantity of iodine colors pure chloroform a very beautiful violet, perfectly similar to the tint of the vapor of iodine; but if the chloroform is mixed with sulphuric ether, even in very small quantity, instead of the violet color, it has more the color of red wine, or even of caramel, if there be any quantity of ether present. This character may assist in detecting the sophistication of chloroform by ether.—*Chem. Gaz, Jan.* 15, 1851, *from Comptes Rendus*, Dec. 2, 1850.

REMARKS ON LINT AS USED AT THE LONDON HOSPITAL,

(Being a continuation of the paper at page 70.)

By James Luke, Esq., Surgeon, and Mr. T. H. Tustin.

I have examined and tested the various specimens of lint which you were kind enough to send to me, and, in compliance with your request, to state my opinion of their comparative excellence, I beg

to say that, considering the qualities which good lint should possess, of a smooth and soft surface, the flue not easily separated from the fabric, the fabric itself having closeness of texture and substance, with a capability of being torn without fraying the adjoining part, I think the specimen marked "BEST LINT, OLD KIND,"* has these qualities in the highest degree, and is that to which I should be disposed to give the preference. Some of the pieces, however, are irregular on the edge, which will induce some waste in use. From its possessing the above-mentioned qualities, it appears to me best suited for the spreading of ointment, the application of lotions, and the formation of compresses, these being the more common purposes to which lint is applied.

The specimen marked "TAYLOR'S PATENT LINT," I think is next to be preferred, and its qualities approach very closely to those of the "old kind." It has a good surface and fabric, and tears well. The edges are even, and its width convenient, and probably there would be less waste in use.

"TAYLOR'S SUPERIOR FLAX LINT" is also a good lint, and possesses sufficiency of substance and regularity of fracture. It, however, possesses the defect, in a slight degree, of the flue being too readily detached from the fabric, and on that account is not so well adapted for the spreading of ointment, as the specimens before-mentioned.

"WACKERBATH AND ROSS'S SUPERIOR GOLDEN FLAX LINT" has the same defect of flue being too readily detachable from the fabric, but in a higher degree than the preceding. It is frayed also by tearing.

"TIPTON'S PATENT LINT" has the flue still more loosely connected with the fabric, so that it is easily raised when ointment of any consistence is spread upon it. It is only four and a half inches in width; and although it tears more readily than any of the above specimens, it does so in the direction of its length, which appears to me to be inconvenient.

"TOSWILL'S PATENT LINT"† is a thready material—the threads running longitudinally, but are connected by a very few transverse filaments. It is very easily torn in the long direction, but is at

*Manufactured by Mr. Oyler, 2 York Street, Camden Town.

†On inquiry we find that this variety of lint is not now manufactured. The sample had been some years in our possession.

the same time frayed. The flue is very readily detachable from the threads, and the fabric is thin and without sufficiency of substance.

Not knowing the comparative cost of the above kinds of lint, I have of course not made cost a matter of consideration, but have endeavored to place them in the position which they should occupy, according to their respective merits as regards quality.

39, *Broad Street Buildings*, *Nov.* 12, 1850.

We subjoin a letter from Mr. Tustin, on the same subject, which was deferred in anticipation of the above, that both communications might appear together.

London Hospital, *Oct.* 17.

Sir,—Owing to the great consumption of lint and rags at this hospital, it was some time ago proposed to make a trial of the patent lint manufactured by "The National Linen Company," to see if any improvement in the quality and saving in the cost could be effected in that article. On examination it was found that a pound of the A 2 lint, at 2*s*., certainly had a greater extent of surface than the same weight of the ordinary rag lint supplied to the hospital at 2*s*. 1*d*. It was found, however, that the gain was more than counter-balanced by some objections which the surgeons and assistant-surgeons made to its use. Passing over several of the minor objections, such as its being too fluffy, and its not giving sufficient support, they pronounced it inconvenient of use, inasmuch as it would not tear in any direction. The use of the old-fashion rag lint is, therefore, preferred here, which has the advantage of tearing readily in one direction, and of being strong, and giving great support in the other.

The quantity of lint and rags used here in 1849, was as follows:

	lbs.	*surface.*	*Cost.*
Lint	1140	2596 square yards	£118 15 0
Rags	720	4040 "	51 0 0

I am, Sir, your most obedient servant, T. H. Tustin.

Lond. Pharm. Journ., *Dec.* 1, 1850.

PARTIAL QUALITATIVE ANALYSIS OF THE TOMATO, (LYCOPERSICUM ESCULENTUM—SOLANUM LYCOPERSICUM).

By Jno. T. Plummer, M. D., of Richmond, Ia.

I have long wondered why the acid of a fruit so extensively used as the tomato, should not have heretofore been determined. My earliest supposition was, that the character of the acid had been ascertained, but that the course of my reading had not brought the analysis into my view. But years have past, and I have not yet met with the slightest allusion to the quality of the acid, until to-day, in turning over the pages of the Transactions of the American Medical Association, I perceive that Dr. Porcher reports that this "fruit contains a *peculiar* acid." I have italicised the word "peculiar," because it implies, that whoever attempted the analysis must have failed to determine the true character of the acid; for, so far from being *peculiar* to the tomato, it is common to very many acid fruits.

It may be that the reporter did not wish to imply that a chemical examination of the acid had been made; but that, selecting his adjective rather carelessly, he merely intended to signify, that the fruit contained an acid—an agreeable acid, or an unknown acid. Be this as it may, it appears that the Association gave, on this occasion, no additional information on the subject. The fact that the hundreds of intelligent physicians, who composed the Association, allowed the statement to pass without note or comment, is presumptive evidence that the character of the tomato acid was not known to them. And if not known to them, to whom was it likely to be known?

Assuming, then, that no examination of the acid in question has been made public, I proceed to give the result of my own researches into the subject.

Every attentive person must have perceived, that the agreeable flavor of the tomato is due to the semi-transparent mass that occupies and often fills the seed cavities, and envelopes the seed. In this translucent pulp, the acid is to be found. The parenchymatous portion of the fruit does indeed contain acid enough to redden litmus, but not enough to be perceptible to the taste.

The yellow tomato was the variety upon which I operated.

1. The glair of the ripened fruit was subjected to pressure in a clean muslin cloth, and the acid juice obtained was then boiled in a Berlin evaporating dish, to coagulate the albumen present. Of this there was a considerable quantity, but it was easily separable by heat—the acid present no doubt facilitating the process.

2. The liquor was then filtered through paper, limpid and colorless. Tested with litmus paper, it proved to be strongly acid. This, indeed, was obvious to the taste.

3. This acid liquor was neutralized with ammonia. Both this alkali and potash gave to the liquor a wine-red color, which was discharged by an addition of the tomato juice, or other acid.

4. To the neutralized liquor (3) was added chloride of lime. This dissipated the wine-red color, but produced no precipitate. Ebullition in a test-tube, however, for a few moments, yielded a white precipitate. This experiment indicated the absence of oxalic, malic, tartaric and paratartaric acids, and the presence of citric acid.

5. The white precipitate (4) was soluble in chloride of ammonium. This solution boiled, again yielded a white precipitate. This reaction with sal-ammoniac afforded another evidence of the absence of paratartaric (racemic) acid.

6. The ebullition of 4 was continued until no more precipitate fell. To the decanted liquor, alcohol was added, but the liquid remained clear. This furnished additional evidence of the absence of malic acid.

7. The acid juice (2) was neutralized with lime water. No precipitate appeared. On boiling, flocculi were produced, and these were redissolved on cooling. This reaction indicates citric acid, to the exclusion of almost every other organic acid.

8. The acid juice (2) was treated with acetate of lead. A very copious, heavy, white precipitate instantly fell. This precipitate was readily soluble in citrate of ammonia; thus again denoting the presence of citric acid.

9. To the filtered, neutralized juice, was added sesqui-chloride of iron. The liquid assumed a yellowish-green color, and remained perfectly transparent. The absence of any reaction in this case excludes the idea of tannic, gallic, acetic and benzoic acids being present.

Thus, then, I determined the certain existence of *citric acid* in

the tomato, and the absence of all other acids. Other reagents were employed, besides those named; but, as they all produced corroborative evidence of the presence of citric acid, to the exclusion of others, I have not thought it necessary to add their indications to the foregoing.

It now became an interesting question, whether the acid discovered was wholly free, or in combination with a base. To resolve this problem, I added to the acid juice (2) a solution of tartaric acid in excess, and strongly agitated the mixture. A granular precipitate was formed, characteristic of *potash*. Tartrate of lime would have redissolved in the excess of tartaric present, and would also have disappeared in sal-ammoniac solution, which did not occur with the present precipitate.

Citrate of potash, then, with excess of citric acid, is the salt which gives to the tomato its agreeable flavor.

George Dow (General History of Dichlamydeous Plants, in four ponderous volumes, London, 1831) says the esculent tomato was cultivated as early as 1596. Can it be possible, that so much time has elapsed, and this fruit has been so very generally relished in different nations, and yet no one has heretofore been prompted to examine into the cause of its palatableness?

I have some further observations to make on this plant, and especially on its medicinal properties; but they will, perhaps, be more appropriate on another occasion.

Western Lancet, Jan., 1851.

ON TRUE OIL OF ORIGANUM.

By Daniel Hanbury.

In a recent number of the Pharmaceutical Transactions*, I endeavored to prove that the article sold in this country as the oil of origanum is, in reality, the oil of thyme (*Thymus vulgaris*,) under which latter name it is imported from the south of France. I further stated, that, so far as my observations extended, true oil of origanum was unknown in English commerce.

* Vide vol. xxii., page 367, American Journ. Pharm.

As it appeared desirable to have an authentic specimen of oil of origanum for comparison, a quantity of the herb was procured and distilled with water in the ordinary way. The plant, which was chiefly collected in the neighborhood of Sheerness, was quite fresh, and very fully in flower when submitted to distillation. It afforded an exceedingly small amount of yellow oil, seventy pounds producing scarcely an ounce. This small produce may in part be attributed to the coolness and humidity of the weather for some time before the plant was collected, as it is evident from the following passage in Brande's *Dictionary of Materia Medica*, that a much larger amount of oil is usually obtained. This author states, "the average produce of essential oil from this herb [origanum] is one pound from two hundred weight; but it varies exceedingly with the season and culture of the plant."

Contrasted with oil of thyme, oil of origanum is distinguished by the following characters:—

1. Odor, which is somewhat analogous to that of oil of peppermint, and entirely dissimilar from that of oil of thyme.

2. Color, which in oil of origanum is bright yellow, while the ordinary kind of oil of thyme is of a more or less deep reddish-brown.

The specific gravity of the two oils is so nearly alike, as to afford no distinctive criterion. That of oil of origanum is .8854, of oil of thyme (average of three samples) .8934, at 62° Fahr.—*Lond. Pharm. Journ., Jan.*, 1851.

REMARKS UPON THE CINCHONA PITAYA OR PITAYA BARK.

By B. W Bull.

Some years since, a sample of bark came under the observation of the writer, which corresponds in its physical characteristics with the description of a bark under the head of False Cinchonas, in the United States Dispensatory under the above name.

Dr. Pereira, in his Materia Medica, and Guibourt, mention the same bark under slightly different names, and all agree in attributing to it the so-called alkaloid Pitaya, said to have been dis-

covered by two Italian chemists, Folchi and Peretti. The parcel alluded to was purchased by a drug-house in Boston, eight or ten years since, from the mate of a whaling vessel; no information was obtained by them respecting the locality in South America, whence it was procured; but it may be inferred that it came from the Northwest Coast, since ports in that region are said to be the only ones which the whalemen frequent.

It is apparently taken from the younger branches of the tree, is closely quilled, the quills are about twenty-four inches in length; in diameter, from three-eighths to one inch, and about an eighth-inch in thickness; it is compact, and destitute of the fibrous structure observable in the true Cinchonas.

The color of the outer surface is a dull brown, interspersed with irregular patches, which are of a lighter tint than the surrounding portions; in some specimens possessing a citron or yellowish brown, and in others a gray color. These spots vary in length from one-quarter of an inch to six inches; and in breadth, from a quarter inch to the whole surface of the quill. Those of the citron color seem to be slightly depressed, as if a part of the exterior coat had been removed, but a close examination shows this not to be the case. The gray spots are not as sharply defined, and appear to be caused by the presence of cryptogamous plants. The inner surface varies from a light to a dark brown, and is in some specimens nearly black. The transverse fracture is irregular, has a deep orange color, and a disagreeable permanently bitter taste, very different from the aromatic bitter of the true Cinchona.

At that time I instituted a series of experiments, with a view of isolating this alkaloid, as well as for the purpose of ascertaining as far as possible the other constituents. I was entirely unsuccessful in detecting any alkaline principle, and the result of my observations were, that, beside ligneous fibre, its principle constituents are, resin, gum in small proportion, a sweetish substance, red coloring matter, a green coloring substance soluble in ether; a volatile principle to which the odor of the bark is due, and inorganic lime salts, consisting mainly of chloride and sulphate, to which may be added a bitter principle, soluble in water and alcohol, which may be classed with the long list of analogous substances under the head of bitter extractive.

It is unnecessary to go into detail in relation to the processes used to arrive at the above results; but it may be added, that this bark subjected to treatment with aqueous or alcoholic menstrua, manifests properties widely differing from those of the officinal Cinchonas under similar circumstances.

The above-mentioned extractive matter resembled very much in its tenacious property, as well as in taste, the extract of Gentian, while several different processes were unsuccessful in enabling me to separate from it any crystallizable principle.

A specimen of this bark was shown by me to Professor Guibourt at the Ecole de Pharmacie in Paris, which he pronounced at once to be the variety from which the above-mentioned alkaloid was said to have been obtained, but that its discovery by Folchi and Peretti was a *betise*. Professor G. seemed to be of the opinion that this bark contained either quinia or cinchonia, though I did not understand that he had investigated it himself. Since that time I have re-examined a portion of this same bark at the laboratory in Giessen, and am quite confident that it contains no alkaline principle whatever, and its tonic properties, if it possesses any, must be traced to other sources, than to the presence of the principles which have hitherto been attributed to it.—*N. Y. Reg. of Med. and Phar.* Feb. 15, 1850.

ON EXTRACT OF HEMLOCK.

By Mr. W. Archer.

In the following experiments upon the expressed juice and dried leaves of the hemlock plant (*Conium maculatum*) made in the laboratory of the Pharmaceutical Society, the results sought were,

1st. The means by which the expressed juice of the plant could be inspissated, so as to form a mass most nearly resembling, in chemical and medicinal properties, the freshly expressed juice.

2nd. Whether, by the separation of some of the constituents of the recently expressed juice, a more efficient extract than that usually met with could be obtained.

3rd. Whether proof spirit, or rectified spirit, was the best menstruum for hemlock leaves.

The evaporating processes, whose comparative merits were tested, were, 1st. Exposure in shallow vessels to the open air in warm dry weather.

2nd. Exposure in shallow vessels to the influence of a *continuous current* of warm dry air. (In this instance an apparatus was employed precisely similar to that recommended in Mohr and Redwood's *Practical Pharmacy*, p. 78, fig. 72.)

3rd. Exposure to the heat of an ordinary water-bath.

The result obtained by the first process is very satisfactory, so far as regards the quality and appearance of the extract obtained; but there is a great obstacle to the adoption of this process, especially on a large scale, viz: the uncertainty of the weather. It appears probable that no more efficient and generally applicable means of effecting the inspissation of hemlock juice, and other analogous fluids, will be met with, than is afforded by the application of the *principle* of the hot-air closet before mentioned.

In the use of such an apparatus we have the following advantages :—

The evaporating liquid requires no stirring or other attention from the commencement until the conclusion of the process.

The temperature of the closet is perfectly at command, within a certain range; the evaporating liquid maintaining a temperature about 40° F. below the temperature of the air passing over it. For instance, we can easily obtain a current of air at 140° F. in the upper part of the apparatus, while the temperature of the liquid placed there does not exceed 100° F. The rate of evaporation is quicker than might have been expected, though perhaps not so expeditious as many would deem desirable; still it was found that the evaporation might be greatly accelerated if means were provided for forcing the current of heated air more quickly over the surface of the liquid by the use of a blowing apparatus, similar in construction to those employed at iron-foundries and smelting houses.

Evaporation by means of a water-bath is too well known to need any remark.

It was thought likely that the chlorophylle and albumen contained in the juice of hemlock might be removed with advantage, in

the preparation of the extract, as these substances are generally believed to be inert.

When the expressed juice was heated to 110° Fahr., and allowed to cool, the whole of the chlorophylle subsided, while the albumen remained in the supernatant liquid in an uncoagulated state; for the purpose of obtaining these two apart from each other, the liquid containing the albumen was filtered from the chlorophylle, heated to 212° F. in order to separate the latter, and again filtered. This second filtrate was evaporated in the hot air apparatus before mentioned, the product was an extract of a brown color, *perfectly* soluble in cold water; from the aqueous solution of this extract, alcohol precipitated a large amount of mucilaginous matter.

By washing with cold water, the peculiar odor of hemlock-juice could be entirely removed from both the chlorophylle and albumen, and as no smell of conia was evident on rubbing either of them with solution of potash, it would appear that the general opinion regarding the inertness of these two substances is correct. Caustic potash appears to be a very delicate test for conia; if any substance containing merely a trace of this alkaloid, be rubbed with liquor potassæ P. L., its presence is at once manifested by the development of its peculiar odor.

Some experiments were made with the view of ascertaining how far the officinal tinctures of hemlock might be regarded as uniform and efficient preparations.

Different specimens of hemlock leaves lost by drying from sixty-five to eighty per cent; it is evident, therefore, that equal weights of fresh leaves, obtained under different circumstances, will give very unequal results in the strength of preparations made according to formulæ in which a given weight of fresh leaves is ordered. Neither can the expressed juice be used with advantage where a given quantity is ordered, as its density varies considerably, depending in great measure on the state of dryness of the plant.

It would appear then, that by the use of dried leaves this source of error may be avoided, and the uniformity of the preparation sufficiently secured, especially as these can be obtained in a pretty equable state of dryness, and with a very slight deterioration of their physical and chemical properties by the use of the hot-air apparatus before alluded to.

The experiments made seem to indicate that rectified spirits (sp. gr. .838 at 62° Fah.) is a more eligible menstruum for hemlock leaves than proof spirit (sp. gr. .920 at 62° Fah.), inasmuch as the mucilaginous and albuminous constituents of the leaves are quite insoluble in the stronger spirit, while conia, in the state in which it exists in the dried leaves, is perfectly soluble in it.

A portion of hemlock leaves, dried in the manner mentioned, was percolated with spirit (sp. gr. .838 at 62° Fah.) until the liquid passed colorless. On treating the residue with water, and evaporating the liquid, an extract was obtained, which gave no smell of conia when rubbed with potash, and had the characteristics of an inert mucilage. A portion of the tincture obtained as above was allowed to evaporate spontaneously, the residue was very small in proportion to the quantity of the tincture employed, and could scarcely be said to possess the characters of an extract, inasmuch as it consisted of a yellow oily-looking semi-fluid substance of very disagreeable odor, mixed with a small quantity of chlorophylle. Another portion of the same tincture was distilled with a strong aqueous solution of potash; the distillate, which evolved the odor of conia strongly, was mixed with a little water and left at rest; after a few hours, a thin oily-looking film, having an alkaline reaction, appeared on the surface.

It has been before mentioned that the object of these experiments was to ascertain the best means of preparing the Pharmacopœia extract of hemlock, the means by which the *most efficient* extract could be obtained, and whether proof spirit or rectified spirit was the best menstruum for hemlock leaves.

It is thought that the following answers may be deduced from the account of the experiments made—

1st. That the best means of inspissating hemlock juice is to subject it, placed in shallow vessels, to the influence of a continuous current of warm dry air.

2nd. That an extract, possessing greater activity in equal doses than that generally met with in commerce, may be obtained by removing the albumen and chlorophylle from the expressed juice before evaporating it. Were this mode adopted, there would not be

the same inducement as there now is to give a factitious green color to extract of hemlock.*

3rd. That as dried hemlock leaves were, to all appearance, deprived of their activity by rectified spirit, and that as the resulting tincture held few of the constituents of the dried leaves in solution, besides conia, and a little chlorophylle, a strong spirit of specific gravity .838, or thereabout, is better adapted for making an effective tincture of hemlock than a weaker spirit is.

As regards the part of the plant to be used, it will, it is thought, be found more advantageous to use the leaves alone than any other part, the expressed juice from the leaves containing a less amount of water, in proportion to the amount of solid matter, than an equal weight of juice expressed from any other part of the plant.

The color of the expressed juice is also much influenced by the part of the plant used, that from the leaves being of a much brighter green than the juice from any other part of the plant.

[*This is corroborative of the views given at pages 207 and 382 of vol. xxii of this Journal, in speaking of the extract of hemlock prepared by the Messrs. Tilden & Co. The new formula in our Pharmacopœia of 1850, just published, directs this extract to be made in the manner described.—

We have recently had an opportunity for comparing the therapeutical power of the Extract of Conia, prepared by Tilden & Co. with the English extract obtained from one of the best importing houses in this city. The latter was introduced into a prescription and used in two grain doses. The physician was meanwhile informed of the brown *vacuum* extract of T. & Co. and directed us to use it when the prescription was renewed. Soon after the patient had commenced taking the latter extract, the peculiar narcotic action of the drug was so much more apparent, that the physician was sent for relative thereto.

We dissolved two hundred grains of this extract of hemlock in water, precipitated with subacetate of lead, filtered, and washed the precipitate well. The solution thus obtained, was mixed with caustic potassa, and shaken with chloroform, as recommended by Rabourdain for Atropia, (see page 159.) The chloroform solution was suffered to evaporate spontaneously, and yielded nearly *one grain* of a brownish semi-fluid, having a strong mouse-like odor, and alkaline reaction. The ascertained activity of this extract, viewed in connection with the small yield of impure *conia*, is an evidence of the potent character of this alkaloid. Geiger obtained but 1-12800th from the fresh leaves, by distillation with water.—*Editor Am. Journ. Pharm.*]

Varieties.

Cotton Seed, (Gossypium herbaceum) as an antiperiodic.—Dr. Frost, (in the *Charleston Journal*, May 1850,) recommends a strong decoction of cotton seed as a remedy for intermittent fever, and says that its use originated with a planter in Newberry District, in cases of that disease among his negroes. Dr. W. K. Davis, of Monticello, S. C., says, "I have never failed to cure a patient with a single dose of it, even where large doses of quinine have failed. Where the patient has been ill of third-day fever and ague for months, in such cases success has followe its use."

The mode of using the remedy is thus described:—After having given a dose of calomel the day or night previous to the attack, followed by castor oil in time to produce a cathartic effect before administering the tea, you put a pint of cotton seed with a quart of water in a vessel, and boil it until half the water has evaporated. Put the patient in bed an hour or two before the usual recurrence of the ague, and give him a gill of the warm tea to drink.

[If this remedy should prove to be as valuable as the above paper suggests, cotton seed should be examined for their active principle.—Editor.]

On the employment of Oxygen in accidents from chloroform.—M. Duroy, Pharmaceutist of Paris, has sent to the Academy a memoir, wherein, after having sought to demonstrate by experiments that pure oxygen can be respired without danger, and that for many hours together, and that that gas respired with chloroform vapor, attenuates its effects and opposes its influence, he thinks that it will be good to always respire pure oxygen after inhalations of chloroform, that by this means we can have all its benefits as an anesthetic agent without its inconveniences. The enervation, pain in the head, inflammatory reaction, and all the secondary symptoms of greater or less importance, and of long or brief duration, which always occur after the use of chloroform, disappear immediately after the operation when oxygen is associated.

It follows also, from the facts collected by the author, that oxygen can be considered as an antidote to all cases of asphyxia from charcoal and other gases and deleterious vapors.—*Journal de Pharmacie, July* 1850.

Improved specific gravity bottle.—Mr. John Abraham of Liverpool, Eng., has lately constructed, (*Pharm. Jour.* p. 125, Sept. 1850,) specific gravity bottle with a new arrangement of the stopper, the proposed advantage of which

is to avoid the inconveniences arising from the expansion of fluids, when the temperature of the air is considerably above that of the fluid experimented with.

An ordinary thousand grain flask is fitted with a stopper having a conical cavity through its centre, the inferior end being smallest, (large stopper.) A second stopper, longer than the first passes down through the conical cavity, and closes its smallest end accurately, (long stopper.) A third short stopper is provided which fits the superior end of the conical cavity, loosely, when the long stopper is removed. (Small stopper.)

The instrument is used thus:—Fill the flask with fluid at the required temperature, slightly grease the long stopper and insert it carefully into the cavity of the large stopper, so as to close it perfectly, then insert the stopper thus arranged, into the flask, permitting the excess of fluid to run over the side. The large stopper is now removed, and the small stopper inserted in its place; after which the bottle is deliberately and carefully wiped and weighed; as there is plenty of space in the cavity of the large stopper to accommodate the expansion of the fluid, no loss is occasioned by overflow or evaporation. The counter-balance weight may include the long stopper or not as the maker chooses.

Aridium, a probably new metal. By M. ULLGREN.—Wallmark recently communicated to the Academy of Sciences of Stockholm, a paper by M. Ullgren, in which he describes a metal, probably new, which occurs in the chrome iron of Röros, and in some other iron ores, which for the present, is called *aridium*, from its resemblance to iron in its oxides.

It dissolves in muriatic acid without disengaging chlorine, and yields on evaporation a deliquescent lemon yellow uncrystallized residue.

A solution of per oxide of aridium does not become black when mixed with an infusion of galls, but intensely indigo blue, and on the addition of acetate of soda, a brownish violet precipitate is formed.

Sulphocyanide of potassium, colors a solution of per oxide of aridium, deep red like iron, but is not discolored by an access of acid. The alkaline sulphurets precipitate it blackish green.

Many other reactions of this supposed new metal, showing its difference from iron and cerium, will be found in the *Pharm Journal*, Sept. 1850.

Leaves of the Bofareira (Ricinus communis) as a Galactagogue.—Dr. J. O. MCWILLIAM, whilst engaged in an official investigation into the nature and history of the yellow fever epidemic in the Island of Bona Vista, in the Cape de Verds, in 1846, had his attention attracted to a remedy commonly had recourse to there, to acelerate and increase the flow of milk from the breasts of child-bearing women. This remedy proved to be the leaves of the common castor oil plant, and also those of the Jatropha curcas, belonging to the same natural family.

The remedy is applied in the form of decoction as a bath to the breasts

for fifteen or twenty minutes, and then a part of the decocted leaves are applied over the organs and kept there until they have become dry by the evaporation of the mixture. These operations are then repeated until the flow of milk is established, which usually occurs in the course of a few hours.—*Charleston Med. Journal*, Jan. 1851.

On the removal of Sulphuretted Hydrogen from solutions. By H. Rose.—When we have to determine the chlorine in metallic solutions, from which the metals are first to be precipitated by sulphuretted hydrogen, the latter must be expelled before the precipitation with a solution of silver can be undertaken. Heat is not practicable for this purpose, as the chlorine might easily be lost by it. In such cases, Rose added sulphate or nitrate of copper. But here also a loss of chlorine takes place, since the precipitated sulphuret of copper takes up chloride of copper. This can, however, be avoided, by adding sulphate of iron to decompose the sulphuretted hydrogen, because then the sulphur only is precipitated; for this, after being washed, contains no chlorine. The chlorine is subsequently precipitated by a solution of silver.—*Pharm. Journ. and Trans.* July, 1850, *from Poggendorff's Annalen*, and *Pharm. Central Blatt*, April, 1850; No. 17, p. 271.

Oxide of Zinc. By M. Sorel.—Some communications having been received at previous sittings of the Academy, containing observations tending to cast a doubt on the freedom from injurious consequences resulting from the employment of the oxide of zinc, M. Sorel stated, that the experience of fifteen years has demonstrated to him that the health of the workmen employed in working zinc or its oxides, is not at all affected from this cause. "During fifteen years," says M. Sorel, "we have employed in our galvanization of iron establishments, several hundreds of workingmen, a great number of whom have been for a long time occupied with powdering and sifting the grey or suboxide of zinc, with which we make our galvanic paint, and never have any of these workmen, who are often in the midst of a cloud of oxide, been ill, or complained from this cause. I would also affirm, that the white oxide is equally as innocuous as the grey oxide. We have manufactured the oxide of zinc on a large scale for several months, and although the workmen have often respired considerable quantities of oxide, they have not suffered the slightest indisposition therefrom.—*Ibid.*

Improvement in making Magnets.—Professor Faraday has recently exhibited at the Royal Institution, a magnet of great power, made by a new process. A magnet of the same description has also been submitted to the Academy of Sciences at Paris. These magnets are made by M. Logeman, optician, at Haarlem. The method adopted in their construction has not been made public, but it is said to be founded on the researches of M. Elias, of Haarlem. The force of these magnets is double that of magnets made in the usual way. The one exhibited at Paris weighed one pound avoirdupois, and was capable of supporting 27½ lbs. On placing a piece of letter-paper

between the poles and the keeper it still supported a weight equal to that borne by the best magnets hitherto made —*Ibid.*

On a mode of distinguishing Paper made from Linen and Cotton. By M. Cesareca.—M. Cesareca of Havanna, states, in this communication, that the employment of caustic potash or soda is the best mode of ascertaining whether linen or cotton has been employed in the manufacture of any kind of paper and recommends the use of the following process as a means of readily ascertaining the difference:—Boil the paper in a mixture of two ounces of caustic soda or potash, in a quarter of a pint of distilled water; the paper made with linen remains unacted upon, whilst that made of cotton is reduced to a pulpy mass. This alkaline liquor also furnishes a means of distinguishing cotton and linen fabricks, and their admixtures.—*Ibid.*

Protection of Electrifying Machines from Dampness.—To protect electrifying machines from dampness, Münch recommends us to draw from the centre of both of the surfaces of the glass-disk towards the periphery, a line with grease, and by which the disk on being turned, becomes covered with a thin coating of fat, and is thus protected against contact with damp air. The insulating glass feet of the machine may also be thus protected by drawing on them a line with grease, and spreading it with a cloth. The machines can then be worked even in damp weather.—*Pharm. Central Blatt*, 1850. No. 12.—[The same effect is obtained by covering the glass surface with a film of some volatile oil, as oil of cloves.—Ed. *Pharmaceutical Journal.*]—*Ibid.*

Marbling Materials.—Four parts of resin and one part of wax having been previously melted together, six parts of a hot solution of glue are added, and after this four parts of powdered alum, with twelve parts of powdered gypsum. Color the composition to pleasure, stir in a quantity of refuse silk [*Seidenabfälle*] and pour in moulds. The surface assumes then a veiny appearance. The walls of rooms may thus be decorated, if the cement be mixed with the refuse of silk instead of with cow-hair —*Ibid, from Pharm. Central Blatt*, 1850, No. 12.

Telegraphs in Germany.—Within the last four months, through the activity of the minister of trade, no less than 1000 miles of telegraph have been opened in Austria, making the total mileage about 2000, of which about one-quarter has the wires laid underground on the improved system. Another 1000 miles will be ready by next year. The telegraph now works from Cracow to Trieste, 700 miles. On the 1st October the new telegraph union between Austria, Prussia, Saxony, and Bavaria comes into operation under a uniform tariff, which is one half the former charges. The progress will be looked upon with interest by the commercial public here, who are very

much in want of facilities corresponding to those enjoyed in the United States and at the same charges.—*Journal of Franklin Institute*, Jan. 1850, *from London Mining Journal*, No. 787.

Chloroform and Ether.—Dr. MARSHALL HALL stated to the Medico-Chirurgical Society, Dec. 10, 1850, that he divided the effects of chloroform into three stages: in the first of which voluntary motion is diminished; the second, in which respiration fails; the third, in which circulation fails:—and from the quickness of its fatality in experiments on animals, considered it a most fearful poison. He feared many of its fatal results in private practice had not been made known, and considered, if its influence is carried beyond its effects on the cerebrum, its application was certainly dangerous. In cases of asphyxia there are more efforts of expiration than of inspiration. He thought it was ill-judged to have changed from ether to chloroform, as the former is less dangerous, and as capable of producing anæsthesia.—*Med. News*, March, 1850, *from Lon. Med. Gaz.*, Dec. 1840.

Cypripedium pubescens, spectabile and *humile*. Ladies' slipper. Moccason plant. By Dr. E. IVES.—The pubescens is called the yellow spider plant. To me they appear identical in their effect on the constitution. I consider the pubescens the most powerful. I have used the three species in a variety of nervous diseases, and have known them to remove epilesy. A hypochondriacal patient, who could not sleep, and was not benefitted by any preparation of opium, never failed of sound rest after taking twelve grains of the powdered root of the Cypripedium pubescens. In certain neuralgic affections, with morbid sensibility of the whole nervous system, it has produced a beneficial effect. A lady, from close application to very delicate painting, became so much effected in her eyes that she could not fix them on any object without excruciating pain. The whole nervous system was at the same time morbidly sensitive. She took the various narcotics, as strychnos, stramonium and hyoscyamus, without any material benefit, but was very much relieved by taking fifteen grains of this cypripedium three times a-day. The remedy was continued for months. The health of this patient was restored after a period of two years by the use of this remedy and a voyage across the Atlantic.—*N. Y. Reg. of Med. and Pharm., from Trans. Amer. Med. Association.*

Comparative Examination of English and Russian Rhubarb. By Dr. MICHAELIS.—Dr. Michaelis, of Hohnstein, has made a comparative examination of English and Russian rhubarb, with respect to the proportion of rhein, bitter and astringent extractive, resin, oxalate of lime, and woody fibre contained in them. He first determined the sp. gr. of six pieces of each kind.

Russian (half and wholly trimmed pieces)	0.918	0.893	0.891	0.857	0.798	0.743
English	0.826	0.801	0.787	0.739	0.694	0.617

One very spongy piece had a sp. gr. of only 0.511. In general, therefore, English rhubarb has a less sp. gr. than the Russian. The greater sp. gr. of the latter sort depends upon the larger proportion of oxalate of lime which it contains. The following table represents the results of the author's analysis of the two sorts:—

	Russian Rhubarb.			*English Rhubarb.*		
Sp. gr. . . .	0.918	0.857	0.743	0.826	0.739	0.617
Rhein . . .	4.3	3.8	3.2	5.3	4.9	3.1
Resin . . .	10.3	8.5	8.1	4.7	5 8	4.6
Oxalate of lime .	15.2	11.7	11.4	10.3	8.7	3.1
Extractive . .	14.7	13.5	22.6	32.3	39.5	26.9
Woody fibre .	14.0	16.4	21.9	23.8	31.2	43.3

In English rhubarb the proportion of resin is smallest, of extractive the largest. In the Russian sort the proportion of oxalate of lime is considerably greater. In the English sort the rhein and woody fibre preponderate. According to the author, the purgative quality of rhubarb depends on the resin and oxalate of lime, and the tonic properties on the rhein and extractive matter; hence Russian rhubarb is more purgative than the English, while the English is more tonic than the Russian —*Pharm. Jour. and Trans.* July 1, 1850, from *Arch. d. Pharm.* 2 R., bd. cix., s. 165—167.

Neutral Citrate of Soda, a new Purgative suitable as a substitute for Saline Mineral Waters, the Citrate of Magnesia, Sulphate of Soda, of Potash, of Magnesia, &c.—M. Guichon, a pharmaceutist of Lyons, has suggested the use of the neutral citrate of soda as a substitute for the citrate of magnesia and as being but half as costly.

This salt is white, without odor, often very slightly acid; it effloresces slightly on exposure to the air; it crystallizes in six-sided pyramids; its chemical formula is $NaO, C_4H_4O^4$.—[More probable, $_2NaO, HO, + C_{12} H_5 O_{11}, + HO$? The formula stated in the text is evidently incorrect.—Ed. Am. Journ. Pharm.]

Acid	49
Oxide of sodium	26
Water	25
	100

It is easily preserved; an excess of acid diminishes very decidedly its purgative powers. Dr. Patton, chief physician to the hospital of Antiquaille of Lyons, has experimented with it both in the state of a neutral salt simply dissolved in water, or in a demulcent drink, and in the state of a neutral salt very slightly acidulated and sweetened. Young subjects are purged by it in the dose of 40 grammes, and adults in the dose of 55 grammes, These experiments, which have been repeated by many physicians of

Lyons, show that this new purgative possesses equal powers with the citrate of magnesia, and is much less costly.—*Amer. Jour. of Med. Sciences*, Jan. 1851, from *Revue Medicale de Paris*, 31st May, 1850.

New Antiperiodics.—The French medical world has been lately on the *qui vive*, on the subject of antiperiodics, stimulated by a prize of 4,000 francs, offered by the Society of Pharmacy, for the discovery of a substitute for Quinine, and to which the French Minister of war has offered to add an equal sum. M. Delioux, Professor of Materia Medica, at Rochefort, maintains that CHLOROFORM is a powerful succedaneum for cinchona and arsenic. A sufficient number of cases of periodic fevers, which are very common at Rochefort, were treated at the hospital there, with chloroform, and with such a regularity of success, that M. Delioux feels warranted in recommending it as a powerful antiperiodic. The chloroform was given in doses of from nine to thirty grains, according to the severity of the case. The patients took it several times before the access, and continued its use for several days. To make a good mixture, the chloroform is to be first rubbed up with syrup, and then it mixes readily with water.—*Jour. de Med. et Chirur. Prat.*, July, 1850.

The Physalis Alkekengi, or winter-cherry of France, is also proposed as a remedy for intermittents. The whole plant, twigs, leaves, capsules and berries, are described as possessing the anti-periodic qualities of cinchona. *Med. Examiner*, January, 1850, from *Gaz. Méd.*, July, 1850.

Poisoning with Dulcamara. By Dr. PLAETSCHKE.—A man 40 years of age, who was using decoction of dulcamara-stalks for a cough, took, one forenoon, from three to four quarts prepared from a peck of the stalks. In the evening he was suddenly seized with numbness in his limbs, and pains in the knees and elbows, dryness of the throat and paralysis of the tongue. These symptoms increased so much in the course of three or four hours, that he could scarcely move either his limbs or tongue. The head remained unaffected, consciousness unimpaired, the pulse quiet, but small and rather hard, breathing regular, the skin cool; there was neither nausea nor vomiting. From the time which had elapsed since taking the decoction, the administration of emetics was contraindicated; recourse was therefore had to stimulants. Camphor was given freely, and the symptoms gradually disappeared.—*London Med. Gaz. from Casper's Wochenschrift.*

Falsification of Cantharides.—M. EMANUEL, pharmaceutist at Isbernheim having received cantharides from a very reputable house, discovered that they were admixed with about 16 per cent. of another coleopterous insect of a brilliant green color, the *Crysomela fastuosa*, that is found in abundance on the *Galeopsis ochroleuca*, the Rubus idœus, the Urtica, the Lamium, etc. This falsification is evidently owing to design and not to a mistake, because

the two insects present to the view such different characters, that it will be impossible to confound them involuntarily.—*Journal de Pharm.* Nov. 1850.

Note on Yerba Maté or Paraguay Tea. By M. Lenoble, of Montevideo.—According to M. D'Orbigny, the Paraguay tea is derived from the *Psoralea glandulosa*, the leaves being slightly heated, and afterwards pulverized.—[Paraguay tea is usually ascribed to the Ilex Paraguayensis.—Ed *Amer. Jour. Pharm.*]

The *Psoralea glandulosa* is a tree as large as a medium sized apple-tree, its bark is whitish and shining, its flowers are poly-petalous, disposed in clusters, its seed have a violet-red color and resemble grains of pepper, whilst the leaf bears much resemblance to that of the orange.

The infusion of *yerber maté* has much analogy with that of tea, and possesses an aromatic odor, bitter astringent taste, and is stomachic and stimulant.

M. Lenoble, by treatment with ether, alcohol and water, has obtained from these leaves, 1st, tannic acid; 2d, chlorophylle; 3d, vegetable wax; 4th, albumen; 5th, volatile oil; 6th, gummy extractive; 7th, a substance which crystallizes in fasciculated needles, to which he has given the name of *psoralein*.

Psoralein is obtained by making an infusion by displacement with cold water, heating it to ebullition, to coagulate the albumen and filtering. The clear infusion is then evaporated to dryness, the extract treated with distilled water and the solution boiled with a little magnesia. The liquid, after having been filtered, was evaporated to the consistence of an extract, and treated with sulphuric ether, which dissolved a bitter principle, and by evaporation yielded a whitish substance crystallized in fasciculated needles, which was soluble in water, alcohol and ether, was not precipitated by sesquisulphate of iron, and which yielded ammonia when decomposed at a high temperature.—*Jour. de Pharm.* Sept. 1850.

Collodion applied to Burns.—Dr. Liman, of Berlin, states that he has found collodion a most excellent application to burns. He has applied it in many cases with the best results. He states that it allays the smarting, forms a protective covering, which excludes the action of the air, and is so exactly adapted to all parts, that no other dressing is required. The first application is attended with some pain, but is soon followed by alleviation of the suffering, and the cure proceeds steadily without pain. Dr. Liman applied the collodion with a camel-hair pencil, covering the entire surface, and daily re-applying it to the fissures and uncovered parts. Dr. Liman relates one case in which it was applied in an extensive burn with immediate advantage, and ultimately a speedy cure, without remaining contractions of the integuments.—*Boston Med. and Sur. Journal, from Casper's Wochenschrift.*

Chloroform, an Antiseptic and Substitute for Quinine.—Statements have been recently laid before the French Academy of Science, that chloroform has been found to be an antiseptic of great virtue, preventing animal decomposition after death, or promptly checking it if already commenced. Besides this use of chloroform, Prof. Delioux, of Rochefort, has recommended it as a substitute for Quinine. He has treated various cases of periodic fevers with this remedy, with regular success. He administers it in doses from 9 to 30 grains, according to the severity of symptoms, mixed with syrup and water.—*Ibid.*

Success of the Kousso in the expulsion of Tape Worm.—To the Editor of the Lancet: Sir—I have much pleasure in forwarding for the Lancet the particulars of a successful trial of the kousso.

Mr. B——, residing in Cheapside, a delicate looking young man had been troubled with tænia for some years, and had taken the usual remedy, turpentine, with partial succcess, having at times seen parts of the worm only. I obtained a bottle of kousso from my druggist, which my patient took on on Sunday morning the 15th; the monster was expelled, *teté et col* complete, measuring twenty-one feet. I need not add that my patient was highly delighted at the good effects of the kousso, and has presented me with the largest specimen of a tape worm I have ever seen.

I am, Sir, your obedient servant,

THOMAS SMITH.

—*Western Jour. Med. and Surg.* Feb. 1851.

Oil for Lubricating Machinery.—M. BOUDET describes an oil, which the French call *liard*, used for greasing machinery. It is made by adding one part of caoutchouc, cut into small pieces, to fifty parts of rape-oil, and applying heat until the caoutchouc is nearly all dissolved. This oil is more unctuous than most of the oils used for machinery, and is not so much affected by the rapid motion of the parts to which it is applied, or by other influences to which it may be exposed. It remains fluid at temperatures below the freezing point of water, and offers little obstruction to the commencement of motion in the machines.

M. Boudet suggests the following method of determining the proportion of caoutchouc contained in this kind of oil:—A weighed quantity of the oil is saponified with potash, and the dry soap treated with spirit, which dissolves the soap with the aid of heat, and leaves the caoutchouc. The insoluble residue is washed with water containing a sixth part of spirit.—*Pharm. Jour.* December, 1850, *from Journal de Pharmacie.*

Preservation of Protosulphate of Iron. By M. GIOVINNI RUSPINÉ.—The extreme facility with which protosulphate of iron passes to the state of persulphate when exposed to the air, has induced many Chemists to seek an easy and sure method of preventing this oxidation. Selmi, Geisler, Bous-

dorff, Abich, Boudet and Poma, have each in their turn devised methods of preservation, which have not been found to answer perfectly. M. Ruspinè having directed his attention to the same subject, and tried several processes, recommends the following as the best:—The crystals of the protosulphate of iron, perfectly pure, are dried, as quickly as possible, between folds of filtering paper, on taking them out of the mother-liquor. They are then put into a drying-closet, the temperature of which is 86° Fahr., where they soon effloresce. As soon as the salt has been reduced to this state, it is rapidly powdered, passed through a fine seive, and put into well-stopped bottles. Thus prepared, the protosulphate will keep for any length of time in a state of purity, although exposed to air and the influence of light. It will form a clear solution, and will contain only a trace of persulphate, which will be of little consequence. The preservation of the salt is due, in this case, to the abstraction of interposed water not in a state of chemical combination, which is always present in the crystals in their ordinary state, and which under the influence of air, causes the peroxidation of the salt.—*Ibid, from Journal de Chimie Médicale.*

Notice of the Seed of Simaba Cedron, used by the Indians of South America as a Remedy for Snake Bite.—In the Pharmaceutical Journal for January (page 344,) we find an account of the *cedron* from the pen of Sir W. J. Hooker. From this it appears that a seed, or the cotyledons of a seed, have been celebrated in New Grenada for its medicinal properties, under the above name. Dr. Purdie, late botanical collector for the Royal Gardens of Kew, writing from the province of Antioquia near the Magdalena, in July, 1846, observes: "I have had the good fortune to detect the celebrated *cedron*, a small tree with the habits of the Jamaica mountain pride, (Melia azedarach.) The seeds are here much sought after, and sold at one real the cotyledon, being considered an invaluble specific for the bite of snakes, for intermittents, and for stomach complaints generally. The bark and wood also abound, in a high degree, with the bitter principle."

"The *cedron* has an erect stem not more than six inches in diameter, crowned by an umbellate mass of branches, with large handsome pinnated foliage."

The *Brussels Herald* informs us that some physiological experiments are in progress to test the antitoxical powers of the cedron; two French gentlemen having volunteered to be operated upon in reference to snake bite. If this statement is correct, we shall probably know more of the real merits of this remedy in reference to the most important of its attributed powers.

Dr. Pereira, in a note to Sir W. J. Hooker, observes: "To the taste, these seeds are intensely bitter, and doubtless like the bitter bark and wood of other simarubaceous plants, (*e. g. Quassia* and *Simaruba*) they possess the

properties of bitter tonics, and might be useful in dyspepsia, and perhaps even in ague. Notwithstanding the faith of the Panama doctors, I am afraid there is not a shadow of hope that these seeds will prove an antidote against snake poisons; all the reputed antidotes to snake poison having hitherto proved unworthy of trust when used under the eye of competent observers."

M. Planchon has the merit of giving a name and assigning a botanical station to the plant producing the *cedron*, and has called it *Simaba cedron*, of the natural family *Simarubaceæ*. Those who desire to be more thoroughly acquainted with the plant, will find a full botanical description, accompanied by a well executed wood cut, in the journal above referred to.

Dr. G. R. B. Horner, U. S. N., in an article on California, published in the *Medical Examiner* for Feb. page 91, refes to the use of cedron in that country for intermittents, and states that it is derived from Panama.

On the Color produced by Tincture of Guaiacum on certain Vegetable Substances.—By J. H. Van Der Brock.—Sometime since, Schönbein published (*Central Blatt*, 1849, p. 173,) some experiments concerning the blue color which slices of potato acquire on the addition of tincture of guaiacum, and mentioned that the substance which becomes blue is more abundant near the skin and about the eyes of the potatoes than in any other part. Van der Brock has tested a considerable number of vegetable grains, &c., such as ripe and unripe French beans, common barley, rye, oats, pearl barley, wheat, peas, millet, buck-wheat, nuts, bitter and sweet almonds, rice, chestnuts, alder-wood, oak-wood, &c., and he concludes that it is the albuminous matter of plants which probably produces this reaction. There are other bodies contained in plants which admit of this reaction, but they have as yet not been sufficiently recognized; they appear, however, to be substances which are in a state of speedy transformation produced by what is called, after Mitscherlich, *contact action*.

Amygdalin, legumin, starch and its isomeric substances, and tannin of gall-nuts, have no influence upon this coloration.—*Pharm Journal*, Jan. 1850, from *Central Blatt.*, 1850, No. xl. and xli., p. 365.

Succinic Acid from the Residue of Sp. Ætheris Nitrosi. By H. Reich.—In the acid residue, obtained by the distillation of alcohol with nitric acid, in the preparation of sp. ætheris nitrosi, Reich found formic acid once only; but in several cases (at least in the collected residues preserved from one to four years) he found oxalic and malic acids, and always saccharic acid. These residues were manufactured into malate of lime, and from this succinic acid was prepared by fermentation with decayed cheese.—*Ibid from Ibid.*

Editorial Department.

PATENT MEDICINE TAX.—The period is approaching when the rights and feelings of those pharmaceutists who sacrifice their pecuniary interest in discountenancing quackery, will be again infringed by the enforcement of this odious tax. The larger number of apothecaries are classed in the five dollar list, and should they happen to overlook the time when it is legally to be paid, some two or three dollars are tacked on in the shape of costs. We think this a fair case for the action of the Trustees of the College of Pharmacy, whose members are presumed to act up to the principles of the *Code of Ethics*, which takes high ground on the subject of secret formulæ. We have long believed that if the proper measures were taken to investigate the unjust working of this law, by legal process, many who now suffer would be relieved, and the expense of the investigation would be more than borne by one year's tax.

We have read the following communication on this subject from our friend Alfred B. Taylor, (than whom we know of no one more sedulous in avoiding the sale of nostrums,) with great satisfaction, and we believe it presents the misconstruction of the law in a clearer light than it has heretofore been exposed.

Mr. Editor:—In your "Editorial Department" for July, 1850, you made a few remarks on the "Patent Medicine Tax," (recently enacted by the State Legislature,) and showed the injustice to those "druggists who feel a desire to discourage quackery and act up to their profession by refusing to sell secret medicines in general," of requiring them by an unreasonable application of the law, to pay the tax for selling "*preparations* made by secret formulæ, as Henry's and Husband's Magnesia, M'Munn's Elixir, and others prescribed by physicians."

As the correct understanding of the legal liability is a matter of considerable interest to the Druggist, and as the law itself has not yet been published (I believe) in the "Journal," it is here subjoined with a few comments.

Extract from the Act of 10th April, 1849.

Sec. XXV.—In addition to the license now required by law to be taken out by venders of merchandise, all manufacturers, venders, agents, or other persons, (except regular apothecaries for the sale of simple medicines, the prescriptions of physicians, and the compounds of the Pharmacopœia, and the several Dispensatories of the United States,) engaged in the manufacture or sale of any nostrums, medical compounds, or patent medicines,—whether

pills, powders, mixtures, or in any form whatsoever, shall also take out from the proper city or county treasurer a license for manufacturing, vending, hawking, peddling, or in any way selling such nostrums, medical compounds, or patent medicines.

Sec. xxvi.—All such venders or sellers shall be classed and required to pay annually to the use of the commonwealth for their respective licenses, as follows:

Those who are esteemed and taken to make and affect annual sales to the amount of one hundred dollars, and not exceeding two hundred dollars, shall constitute the *fourth* class, and pay five dollars.

Those to the amount of two hundred dollars, and not exceeding five hundred dollars, the *third* class, and pay ten dollars.

Those to the amount of five hundred dollars, and not exceeding one thousand dollars, the *second* class, and pay thirty dollars.

Those to an amount exceeding a thousand dollars and not exceeding two thousand dollars, shall form the *first* class and pay fifty dollars: *Provided*, That those who are esteemed to sell an amount exceeding two thousand dollars, shall pay a tax of fifty dollars and three per cent. upon all sales above two thousand dollars.

Sec. xxvii.—"Any person convicted of violating the provisions of the preceding sections, shall be fined in a sum not less than fifty, nor more than five hundred dollars, for each offence; one half to be paid to the county treasurer for the use of the commonwealth, and the other half to the person or persons who shall prosecute such offender."

This law was framed by a committee of physicians with the avowed object of imposing a restraint on empiricism: it is therefore obvious to the commonest apprehension, that that construction cannot be a legitimate one, which tends directly to thwart this primary interest of the law. Our sagacious and *disinterested* tax-gatherers, have insisted that all articles *prepared* by a secret process, are liable to taxation. And as a variety of such articles are necessary to the stock of every respectable druggist, the most determined opponent of quack mixtures, is required to pay the same tax, as he whose sole business is the vending of patent medicines,—unless, indeed, the latter is *unfortunate* enough to fall within a higher class than himself! The tendency of all this, it is needless to add, is to make those who are taxed for what they do not keep, seek indemnification for their loss, by the profits from nostrums heretofore so sedulously avoided; in other words the law is made to *encourage* the sale of quack medicines!

Nothing can be clearer, on a careful examination of the language of the law, than that only those engaged in the sale of "nostrums, medical compounds, or patent medicines" are subject to this license tax. An article like "Henry's Magnesia" is certainly not a "medical compound," or a "patent medicine;" and is not a "*nostrum*." A "nostrum" is defined by Webster, to be "A medicine the *ingredients* of which are kept secret, for the purpose of restricting the profits of sale to the inventor or proprietor."

As you have well remarked in the "Journal" for October 1850, there is the widest distinction to be made "between a reservation of the skill and manipulations required in the preparation of a medicine, and a reservation of its composition. The most fastidious member of the College of Physicians, may use Henry's magnesia, without implicating his character as an opponent of quackery, because he knows what he prescribes as well as if he had witnessed its preparation; and any chemist can assure himself of its nature." The "*ingredients*" of Henry's Magnesia are not "kept secret:" most indisputably therefore, it is not a "nostrum."

It is equally clear, first, that all "compounds" recognized by "the several dispensatories," are specially *excepted* from the operation of the law; secondly, that all "prescriptions of physicians"—*whatever their character* are likewise expressly excepted; and thirdly, that all "*simple* medicines" —*no matter how prepared*, are as expressly excepted. *A "simple medicine" cannot signify an *elementary* medicine,—(as sulphur, charcoal, iron, &c.)—for such form a very small and comparatively unimportant class. It must signify one simple in its character and remedial action; that is, a medicine "not mixed or compounded." A strictly *chemical* compound, (as Magnesia, or its sulphate,) is not properly either "mixed," or "compounded:" it is not a "*medical* compound;" it is essentially a "simple medicine." Hence an improved manufacture of Epsom Salts, Magnesia, Quinia, or Morphia,—*whether by secret process or not*, cannot come within the operation of the tax.

Lastly. It is plainest of all, that no vender of patent medicines can possibly be subject to this tax, unless he falls within one of the "classes" specially required to pay license. In other words, all who do *not* make "annual sales to the amount of one hundred dollars," are most positively excluded from any ratio of taxation under this law. The opinion of several distinguished lawyers (among whom may be mentioned the Hon. J. W. Ashmead—District Attorney, U. S.) have been consulted; they are all clear upon this point.

Yours very truly,
A. B. T.

A MERITED HONOR.—We learn with pleasure through the Boston Med. and Surg. Journal, and the London Medical Gazette, that "Mr. Jacob Bell, well known as the editor of the [London] Pharmaceutical Journal, has been returned Member of Parliament for St. Alban's by a majority of 129. We think that the introduction of this gentleman into the House of Commons will be beneficial to the interests, not only of those whose rights he has specially and ably advocated, namely, Pharmacuetical practitioners,

*It may well be questioned, whether the framers of the law did not evidently design by the parenthesis in the 25th sec. of the act, to "except *regular apothecaries* for the sale of simple medicines, prescriptions," &c. *entirely from liability to the license law.*

but of the medical profession in general." If the character of the honorable Member is judged by the spirit manifested in his Journal, we can readily believe his elevation to a seat in Parliament will prove advantageous to the professions alluded to, and equally so to any other interests that come within the legitimate sphere of action of a member of the House. We know of no editor more fearless in the discharge of his peculiar duty, or in the advocation of the rights of the profession he represents.

TRIAL AND SENTENCE OF AN APOTHECARY FOR A MISTAKE, RESULTING IN DEATH.—Many of our readers may recollect the occurrence of a fatal error in dispensing a prescription, at a store in Moyamensing, some months since, and which was fully noticed in the public papers at the time.

The prescription called for thirty grains of sulphate of quinia, to be divided into five or six parts. The proprietor of the store was absent from the city, and left his establishment in charge of his two assistants, both *students of medicine*, one having been in the store for some length of time, the other for a shorter period. Unfortunately, it fell to the lot of the latter to dispense the prescription, his senior, to whom properly belonged the duty, being pre-engaged, but in the store. By a most unaccountable confusion of ideas, or absence of mind, the young man took the sulphate of morphia bottle (which was labelled) weighed out the potent salt, and dispensed it, impressed with the idea that he was handling sulphate of quinia. A dose was administered to the patient, a young lady of eighteen, and had time to work its fatal consequences, unchecked by treatment, before the attendants were attracted by unusual convulsive symptoms, which induced them to send for the physician. The latter at once surmised there was something wrong, went to the apothecary, asked to see the prescription, and, finding it correct, called for the vessel from which the powder had been taken, when, true to his previous infatuation, the young man handed the bottle of sulphate of morphia, and not until the physician called his attention to the label did the appalling truth flash upon him. The poisoning, despite the most unremitting endeavours of the medical gentlemen, terminated fatally.

In process of time a true bill was found by the Grand Jury against the young man and his *employer*, notwithstanding the latter was absent from the city at the time of the mistake. When the case reached the Court, William McFadden (the assistant) plead guilty, per accident, which at once relieved his employer from the unpleasant and *unjust* position in which circumstances had placed him. The jury brought in a verdict of involuntary manslaughter against the defendant.

In our opinion the Grand Jury committed an error of judgment in implicating the employer, until they had proved that his proper substitute and *responsible agent*, the elder of the assistants, was incapable of attending to the duties of the shop, in a correct and efficient manner. If his first assistant was

capable, the employer was as free from censure as his nearest neighbor. In a well regulated store, the elder assistant is responsible for the acts of his subordinates, in any matter relating to the service of the public committed to his charge, most especially so as regards physicians' prescriptions; and this feeling of responsibility should not only be impressed on the chief assistant, but juniors should be early trained not to rely too much on their own judgment, (however strong the temptation of a laudable ambition to learn fast,) but in all but the most common and well understood cases, to consult their senior. Had Mr. McFadden pursued this course, and been directed by his superior to do as he did, he would have been blameless for the result; nor can we exonerate his companion, in this instance, from the responsibility of the act, as it was his duty to have *seen* that the prescription was properly dispensed, especially in a case where the dose was unusually large.

On the 22d of March, according to the Evening Bulletin of that day, "William McFadden was sentenced to three months in the County Prison." Judge Parsons, after pronouncing the sentence, said "that he was convinced that the act was accidental, and it could not be attributed to a want of knowledge in the preparation of medicines, for the defendant was esteemed by distinguished physicians and professors, for his studious habits, and knowledge of the business in which he was engaged."

The Judge, very properly, expressed his sympathy for the young man, whose excellent moral character, he hoped, would in no wise suffer by this unfortunate occurrence.

Whatever opinion may be formed of the justice of this sentence by those whose familarity with the exigencies of a dispensing business can best qualify them to judge, it must be admitted that the Court has done its duty, and by this act has shown what may be expected in future. Our first impression was that the punishment was too severe, in view of the accidental character of the error; and that it should be classed with the mistakes of mothers and nurses, in giving laudanum for paregoric; but on reflecting that the Apothecary claims the patronage of the public on the grounds of his special qualification for the services they require, in justice, we cannot but approve of the sentence, whilst we would that a pardoning hand was stretched forth to relieve its subject. Let pharmaceutists be wise and profit by the example; let them not only seek protection, in the careful selection of assistants, and the instillation into these of the responsibility that should be *felt*, and the accuracy that should be *manifested* in the act of dispensing; but also place a guard against errors of inadvertence, by such a location, and conspicuous labelling of potent medicines, as shall render their unintentional substitution almost a miracle; and above all, let them impress on the minds of their junior assistants, from the first day of their service, that no poisonous drug shall be dispensed by them without the knowledge and approval of their seniors, much less a physician's prescription, until such time as their knowledge and experience shall sanction it.

College of Pharmacy at Boston.—Since the announcement in our last number, of the movement among the apothecaries of Boston, we have been looking for its results. On the 13th of Dec. another meeting took place, at which it was "*resolved*, that it is the unanimous sense of this meeting that there should be an institution for the cultivation of pharmaceutical knowledge." "It was therefore voted that a committee of five be appointed to consider the subject, and report some draft for the formation of a pharmaceutical society to the next meeting." A committee consisting of Messrs. T. Restieaux, H. W. Lincoln, J. Kidder, Jr., and S. R. Philbrick, and D. Henchman, were appointed; the latter declining to serve. We hope this movement will be productive of substantial results, and open another arena in which pharmaceutical talent may expand and produce its fruits.

New York College of Pharmacy.—Through the *N. Y. Medical Gazette* for Jan. 1st, we learn that the officers of this Institution have addressed a memorial to the Legislature of the State of New York asking a pecuniary grant for the benefit of the College as a school for the education of Apothecaries. Our cotemporary remarks: "The memorial is ably written, and referring to the fact, that for twenty-one years this College of Pharmacy has been conducted by its members without any pecuniary aid from the State, respectfully solicts a donation of ten thousand dollars, and an annuity from the State of two thousand dollars per annum. The former sum they propose to appropriate to the erection of a suitable College building, and increase their library, cabinet of specimens, chemical and philosophical apparatus, &c.; while the latter sum they need for the renumeration of their professors, who have hitherto served the College with very inadequate pay."

We are not sufficiently acquainted with the temper of the Legislators of our sister State, to form any opinion of the success that such an application is likely to meet with, but for the cause of Pharmacy we hope the prayer of the memorialists may be granted. The pharmaceutical body in the city of New York is a large one, and, like our own and that of the other large cities, includes many practitioners of very meager qualifications. The fees of their School of Pharmacy are already too low, and should not be reduced; but with such a capital and income, they could present far greater inducements to the pharmaceutical student than they at present can. We know well the up-hill struggle that is requisite in building up the reputation of a school of Pharmacy, from the long and continued exertions that have been made in favor of our own school by the officers and members of our College, and we cannot but wish that our New York brethren may find some shorter route to success, than that which has necessarily been pursued by the pioneer Pharmaceutical School of the United States.

Philadelphia School of Pharmacy, Session 1850—51.—The session just passed has been the most successful in the annals of the School, as it

regards the number of the class, and that of its graduates, catalogues of whom are subjoined. The medical profession in their annual association appear to have awakened to the importance of having Pharmacy conducted by persons fitted for the businsss by practical and theoretical education. Where no law exists to compel qualification, the only influence that can be brought to bear is public opinion. The first action of the public voice is generally in favor of the man who appeals most strongely to the eye by his extensive show, or to the pocket by cheapness of price: but experience is a rough and impartial teacher, and has to a considerable extent convinced the medicine-buying public of the fact that it requires the possession of something more than colored bottles, a few drugs, and the implements for dispensing them, to constitute a pharmaceutist worthy of his responsible position. Physicians also are becoming more and more impressed with the truth that their success as practitioners depends largely on the ability and conscienciousness of the apothecary. To these two influences, therefore, viz: the sense of self-preservation in the people, and the demand for efficient co-operation from the practitioner, acting in unison, we look more for real pharmaceutical reforms than to the enactments of Legislatures.

In looking over the class we find several gentlemen who are engaged in business, and who, seeing the importance of are gular pharmaceutical education, have availed themselves of the advantages of our school at the sacrifice of considerable inconvenience. This is a favorable indication, and is a proof that with a proper spirit, the existing as well as the rising pharmaceutical body may be improved.

There are apothecaries who scout the idea of any benefit being derived from education beyond the precincts of the shop; who consider pharmacy solely as a practical art, requiring no study but what is picked up in the busy career of an apprenticeship. They argue that boys get their heads filled with impracticable notions which interfere with the, to them, true principles of practice. Drugs which have heretofore been dispensed without a question as to value, are condemned by these juniors as unfit for dispensing, and practices to which long usage has given its sanction, are exposed as incompatible with the just principles that should regulate the conduct of the apothecary toward the physician and the public. Such are some of the lecture-acquired notions condemned by the opponents of pharmaceutical education. We have known the whole character of a dispensing establishment changed by the silent influence of apprentices stimulated by a wholesome ambition to excel, and sustained by just principles of action, in spite of the antiquated notions of their employers, who, with whatever sacrifice of self-importance, yielded to a course which trial proved to advance their pecuniary interests, whilst it increased their reputation.

Mere lectures will not make apothecaries, but oral instruction properly illustrated by experiments and diagrams, when addressed to earnest young men or boys engaged in the daily routine of the shop, is productive of the

highest usefulness. It corrects their crude notions of the phenomena they meet with; it suggests improvements in shop practice,s followed from meretradition, and it opens out before them as an illustrated map, the length and breadth and the capabilities of their profession, as a sphere of usefulness and a field of ambition. We know that some boys and even young men who are *sent* to the lecture room derive comparatively little from its teachings, because they are not interested, their minds are wandering far from the subject that should have engaged them as pharmaceutical students, and their bodies are often as far from the lecture room as their minds, engaged in the pursuit of frivolous amusement, frequently as hurtful to their moral sense, as it is devoid of mental improvement. As well might argument be brought against common schools because idlers neglect their duties.

Extract from the Minutes of the Board of Trustees of the Philadelphia College of Pharmacy.

At the Annual Examination at the School of Pharmacy, the following named gentlemen, having complied with the rules of the College, and having passed a satisfactory examination, were declared by the Board of Trustees Graduates of the Philadelphia College of Pharmacy.

James B. Campbell,	Thesis on	Vin. Tinct. of fresh root of colchicum.
Robert Ramsden,	"	Phytolacca Decandra.
Henry M. Troth,	"	" "
D. F. Goodyear,	"	Nepeta Cataria.
John C. Savery,	"	Fluid Extract of Serpentaria.
Alfred A. B. Durand,	"	Hydrastis Canadensis.
Thomas H. Montgomery,	"	Scammony.
James Stratton,	"	Pharmacy.
J. Henry Abbot,	"	Panax quinquefolium.
Louis Hughes,	"	Fluid Extracts.
Samuel S. Garrigues.	"	Matricaria.
Weatherill Peterson,	"	Eupatorium Perfoliatum.
George Canby,	"	Phosphate of Ammonia and Magnesia.
William King,	"	Commercial varieties of Sarsaparilla.
William Taylor,	"	Fluid Extracts.
Charles S. Braddock,	"	Salix Babylonica.
John D. Finley,	"	Syrups of the Pharmacopœia.
William D. Elliot,	"	Cimicifuga Racemosa.
Louis De Barth Kuhn,	"	Pharmaceutical Ethics.

The Annual Commencement of the College will be held on Friday, the fourth of April, at the Sansom Street Hall, on which occasion the Degree of Graduate in Pharmacy will be publicly conferred upon the above named gentlemen.

The Valedictory Address will be delivered by Professor Robert P. Thomas of the Institution.

Thomas P. James, Chairman,

Alfred B. Taylor, Secretary.

PHARMACOPŒIA OF THE UNITED STATES OF AMERICA. Published by authority of the National Medical Convention held at Washington, A. D. 1850. Philadelphia; Lippincott, Grambo & Co. p. p. 317.

We have the pleasure of announcing the publication of the new United States Pharmacopœia. Although delayed several months beyond the year of its commencement, it has been issued a year earlier than the edition of 1840. We have neither time nor space to notice its contents in this number, but may say the typography, paper, etc., are of a quality creditable to the publishers and worthy of the work. The following is a list of the newly introduced drugs and preparations.

I. SUBSTANCES INTRODUCED INTO THE MATERIA MEDICA.

Aconiti Radix.
Althææ Flores.
Arnica (*flowers.*)
Arsenicum.
Cydonium.
Extractum Cannabis.
Gossypium.
Helianthemum.
Lappa
Macis.
Oleum Amygdalæ Amaræ.
Oleum Morrhuæ.
Ovum.
Plumbi Nitras.
Potassæ Chloras.
Spiritus Vini Gallici.
Vinum Rubrum.

II. PREPARATIONS INTRODUCED.

Acidum Gallicum.
Aconitia.
Aqua Amygdalæ Amaræ.
Argenti Nitras (*in crystals.*
Argenti Oxidum.
Arsenici Iodidum.
Calcis Carbonas Præcipitatus.
Ceratum Zinci Carbonatis.
Chloroformum.
Collodium.
Emplastrum Ammoniaci cum Hydrargyro.
Emplastrum Picis Burgundicæ.
Extractum Colchici Aceticum.
Infusum Sassafras Medullæ.
Infusum Taraxaci.
Infusum Zingiberis.
Liquor Arsenici et Hydrargyri Iodidi.
Liquor Ferri Nitratis.
Liquor Magnesiæ Citratis.
Mistura Glycyrrhizæ Composita.
Oleum Copaibæ.
Oleum Tabaci.
Extractum Cubebæ Fluidum.
Extractum Opii.
Extractum Piperis Fluidum.
Extractum Rhei.
Extractum Rhei Fluidum.
Extractum Sarsaparillæ Fluidum.
Extractum Sennæ Fluidum.
Extractum Spigeliæ et Sennæ Fluidum.
Extractum Valerianæ Fluidum.
Ferri Citras.
Ferri Pulvis.
Glycerina.
Infusum Capsici.
Potassæ Citras.
Potassii Bromidum.
Syrupus Acaciæ.
Syrupus Acidi Citrici.
Syrupus Pruni Virginianæ.
Tinctura Aconiti Radicis.
Tinctura Cardamomi Composita.
Tinctura Kino.
Tinctura Nucis Vomicæ.
Trochici Sodæ Bicarbonatis.

Oleum Valerianæ.
Pilulæ Ferri Iodidi.
Plumbi Iodidum.
Potassa cum Calce.
Unguentum Belladonnæ.
Unguentum Potassii Iodidi.
Unguentum Sulphuris Iodidi.
Zinci Carbonas Præcipitatus.

LECTURES IN THE

PHILADELPHIA COLLEGE OF PHARMACY.

Thirty-first Session of the School of Pharmacy, 1851-52.

The Lectures in this institution will commence on Tuesday, October 14th, and terminate about the middle of March. They will be held in the Hall of the College, Zane street, on Tuesdays, Thursdays, and Saturdays, two lectures each evening at 7 and 8 o'clock.

ROBERT BRIDGES, M. D., General Chemistry.
WILLIAM PROCTER, Jr., Theoretical and Practical Pharmacy.
ROBERT P. THOMAS, M. D., Materia Medica.

The lectures on Chemistry will embrace in a systematic view the laws, operations and results of this science, and its relations to Pharmacy. The elements concerned in inorganic nature, and their compounds, will receive such notice as their relative importance in this respect demands; and will be illustrated by experiment, diagram, specimens, and processes.

Organic chemistry will also receive its full share of attention, and all its compounds, possessing general or pharmaceutical interest will be brought under consideration in a similar manner.

The lectures on Pharmacy will treat, of the elementary operations required in the preparation of medicines; viz.,the management of heat, the manipulations in the processes of pulverization, solution, evaporation, distillation, crystallization, &c.; all illustrated by the most approved models, diagrams and apparatus.

The pharmaceutical preparations of organic drugs will be considered as follows; viz. The simple preparations of each drug will be noticed under the head of that drug, and each compound preparation under the head of its chief constituent. Each class of preparations as tinctures, extracts, plasters, &c., will receive a general notice in its proper place. The classification of the subjects will be in groups founded on the nature of their chief constituents; as for instance: the amylaceous group, the gum yielding group, the resin yielding group, the tannin yielding group, the alkali yielding group, &c.: each group being prefaced by a general description of the principle or principles giving it name. The preparations of each drug will be preceded by such notice of its chemical constitution, as will exhibit the kinds of treatment best calculated to extract and preserve its active portion.

The course will conclude with the processes for those inorganic chemicals which may be prepared by the apothecary himself, when desirable, without any reference to their systematic chemical relations.

The lectures on Materia Medica will be exclusively devoted to vegetable and animal substances, their origin, commercial history, characters, composition, and medical properties, together with their adulterations and the means of detection. The course will be commenced with two lectures on structural botany, and will be made practical and demonstrative by the exhibition of an extensive collection of the substances, their varieties and falsifications, aided by accurate drawings, and a full series of exotic and indigenous plants in their dried state.

Experiments illustrative of the proximate organic principles and modes of their detection, with the difference between genuine and spurious articles, will be introduced whenever deemed interesting or important.

Tickets for each course, $8 00, to be obtained from the Professors.

Matriculation ticket, $2 00, to be procured of the Secretary,

ALFRED B. TAYLOR,
Corner Walnut and Eleventh Sts.